Electrolux
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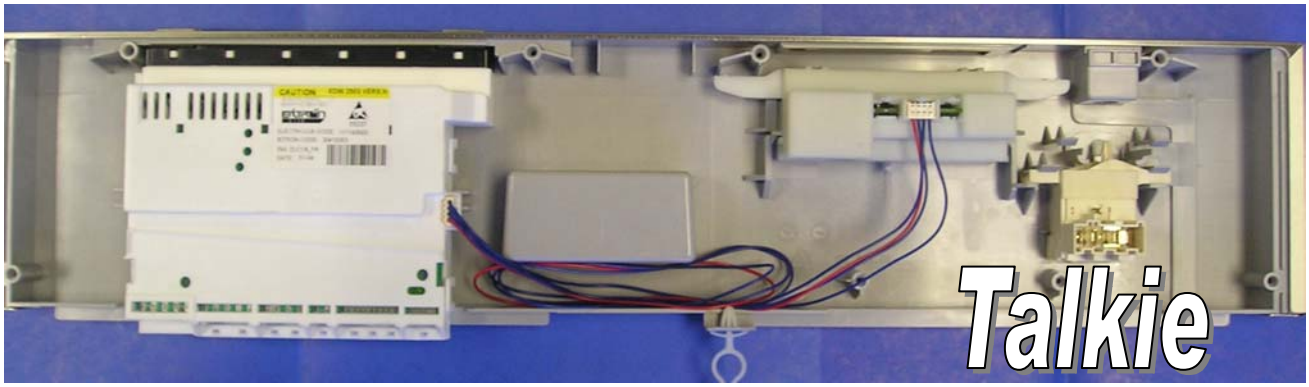
SERVICE MANUAL

DISHWASHER



Dishwasher with electronic control EDW 2503-LCD & "Talkie"
(Functionality)

"DIVA" 60cm
"DIVA BIG" 60cm

"totally integrated"
911 938 … 911 988…

Production:
ZM - Solaro (IT)

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Purpose of this manual

The purpose of this manual is to provide service personnel (who have the basic knowledge necessary for repairing dishwashers) with information on dishwashers equipped with the EDW2503 electronic control system with/without “Talkie” functionality, which are produced in the Solaro (MI - Italy) factory.

For detailed information on the water circuits and build characteristics of the appliance, refer to the Service Manual for the “DIVA 60 cm” (publication no. 599 35 55-25 e 599 35 87-82).

1 PRECAUTIONS

- **Electrical equipment must be serviced by qualified personnel, only.**
- **Pull out the power plug before working on internal components.**

Important!

When the appliance is plugged in, mains voltage is present on all circuit boards even if the ON/OFF button is OFF

2 GENERAL CHARACTERISTICS

Power supply	⇒	230 - 240 V / 50 Hz (limits 187-254 V)
Total power drawn	⇒	2300 W
Water supply	⇒	Min. / Max. Pressure: 5 - 80 N/cm^2
Load capacity	⇒	12 Place settings
Dimensions:		
- **width**	⇒	59.6 cm
- **height**	⇒	81.8 - 87.8 cm (86,8-94,8 for the “BIG”)
- **depth**	⇒	55.5 cm
Controls:		
Power up / Power down	⇒	ON/OFF button, always installed
Selection of programmes	⇒	By button
Selection of options	⇒	By button
Display system	⇒	LCD
Communication (Talkie vers.)	⇒	Specific electronic board and speaker
Washing systems	⇒	Combined / Pulse
Water level control	⇒	Pressure switch + Software
Water heating	⇒	Heating element enclosed in tube (2100 W)
Temperature control	⇒	NTC temp. sensor
Drying systems	⇒	Activ / Turbo
Safety systems / Alarms	⇒	Full protection of water/electrical systems and software

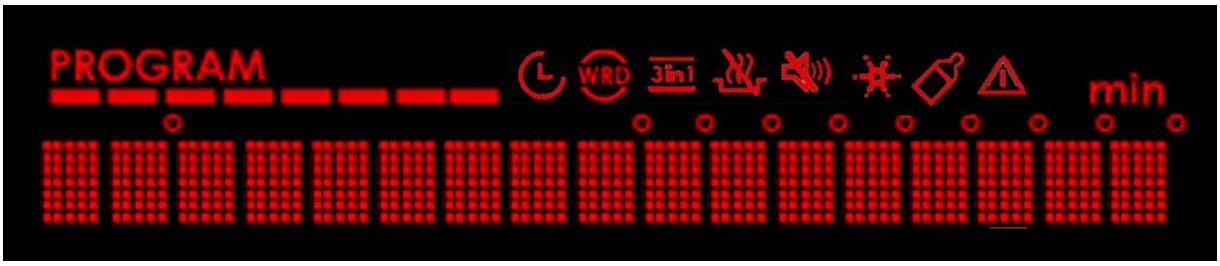
3 CONTROL PANEL

The configuration of the control panel may vary with:

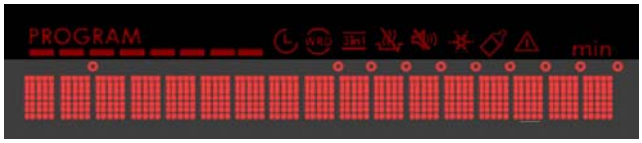
- Brand and appearance of unit
- Type of circuit boards used
- Number of buttons for selecting programmes
- Number of buttons for selecting options
- Number of LEDs and/or configuration of LCD

3.1 LCD

These models use a new LCD display which can display the most common languages and all letters of the alphabet, numbers and symbols.

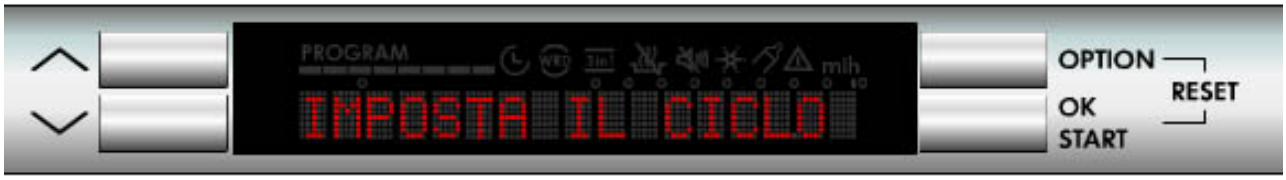


Depicted above is the LCD display with all elements lit. Depicted below are figures and explanations of what may appear line-by-line on the display:

The first line will show: 1. **the indication of the "programme":** the segments below **program** identify the number of washing phases included in the cycle selected. 2. **the symbols** identify the cycles and options selected or the advisory and alarm conditions	
The following may appear on the second line: 1. **the name of the cycle selected** (while it is being set) 2. once the cycle has started, **the washing phases** in the cycle and the **temperatures** involved) 3. **options selected/suggested** 4. **time to end of cycle** or **delayed starting time** (in hours or minutes)	

	Delayed start time has been selected		Certain types of programmes have been selected
	"3-in-1 detergent" option has been selected		"Eco-drying" option has been selected
	"Sanitize" programme has been selected		"Extra rinse" option has been selected
	An advisory/alarm has occurred		Buzzer has been disabled

3.2 Controls



3.2.1 Turning the appliance on and off (S0)

The ON/OFF button is installed on all models. The **S0** button is used to turn the unit on and off. Turning off the unit with the S0 button does not cancel the programme in progress.

Important!
If the unit is plugged in, mains voltage is present on all circuit boards even when the ON/OFF button is not pressed (when appliance is shut off.

3.2.2 Selecting programmes

It depends on the type of styling; it can be carried out as follows:

- The buttons which allow scroll up and down the list of the available programmes;
- The button which allows the scrolling in sequence of all available programmes.

If the display shows the desired programme, press the OK-Start button to start it and close the door.

The operation of the buttons and their number exclusively depend on the software in the machine.

3.2.3 Selecting options

- Pressing the “Options” button many times all the available options are displayed in sequence
- To enter each sub-menu press OK-Start button
- Press Options button again to vary the choice
- Premere il tasto OK-Start per confermare e memorizzare l’operazione effettuata.

The type of options available exclusively depends on the software in the machine.

In all dishwashers with this typology of electronic are always present the “Options” and “Ok/Start” buttons since these buttons are used to access the service mode (see 9).

The “Cancel” button has been replaced by the combination of two buttons as described in the imprint of the control panel.

3.2.4 Reset

- When the appliance is on and in selection mode, with the LCD showing the message “Set the cycle”, press for at least 5 seconds the buttons associated to “Cancel” function: the LCD language and brightness default settings are reset. This chance may result useful in case of wrong selections of unknown languages.

3.3 “Talkie” Version

Some EDW2503 dishwasher models features also the “Talkie” functionality. These models are configured so that they can communicate in different languages according to the brand/market.

The “Talkie” version of the EDW2500 features a speaker contained in a plastic box (figg. A and B), hooked to the tie and screwed to the hinge, positioned on the left front side of the inner door (fig. C) and connected electrically to the board with the voice function, which is fitted with 2 screws under the control panel (fig. D).

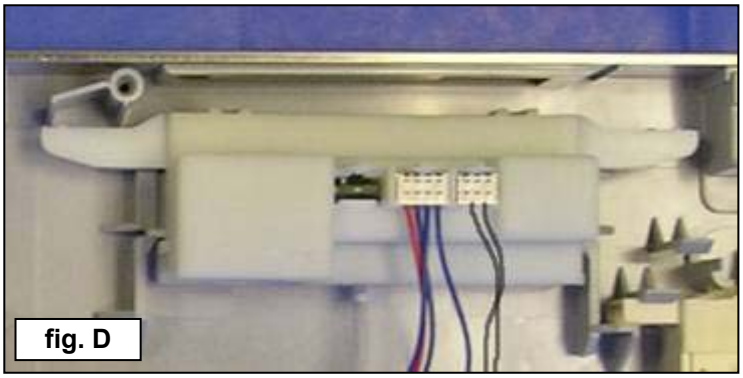


fig. D

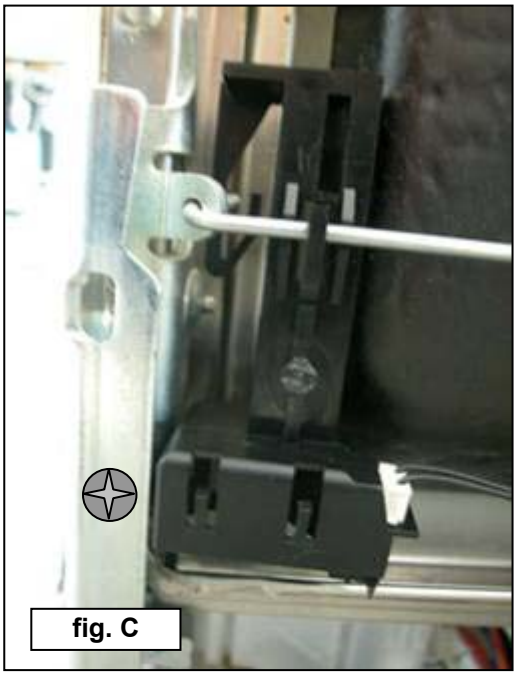
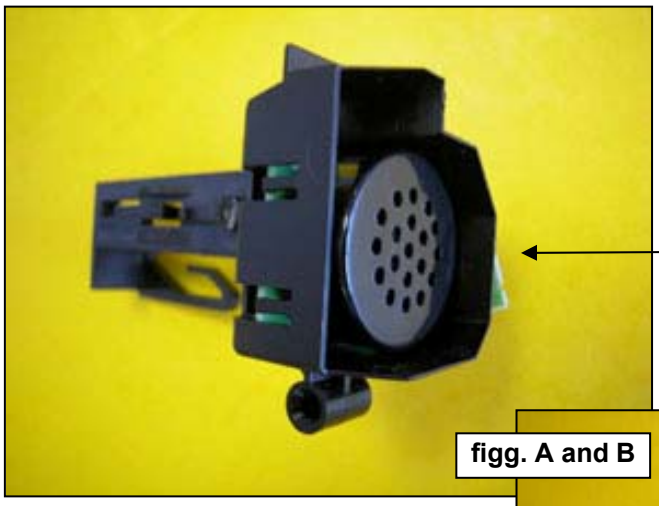
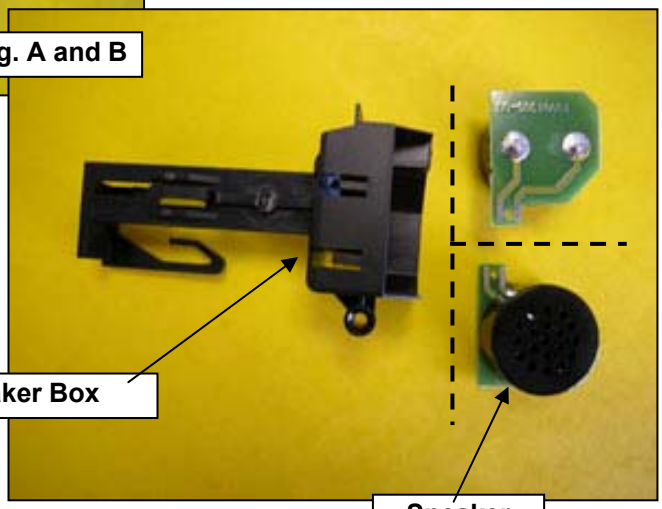


fig. C



figg. A and B

Speaker Assembly



Speaker Box

Speaker

3.3.1 Vocal messages

During the setting of the washing programme three types of vocal messages can be heard:

- messages that explain the utility of the programme and describe the various options
- messages that confirm the selection of the option
- messages that remind the possible necessary operations of maintenance

During the programme it can be heard:

- alarm messages in case of malfunctioning also temporary; in these cases the message is immediate and is repeated till the solution of the problem

The vocal messages can be deactivated using the button **Options** and adjusting the volume on **Level 0**.

Warning: even if the voice is excluded, the alarm vocal messages remain always active!

NOTE: The vocal messages can be reproduced in different languages. Selecting the desired language to display the messages on the display, the same language will be automatically set in the voice control board.

All the possible vocal fragments are listed below; the software will buil the message by composing one, two or more fragments:

English
Messages
Hello
The program is running. To complete the program
Close the door
Remember to clean the dishwasher filter
Remember to put salt in the special container
Remember to put rinse aid in the special container
Press OK-Start to continue
Programs
Select the program
70° INTENSIVE
AUTOMATIC
30 MINUTES
ENERGY-SAVING
45° GLASS
50° NORMAL
65° NORMAL
PREWASH
65° QUICK
50° SAVING
45° GLASS
50° ECO
65° ECO
50° BIO
50° BIO SAVING
60° QUICK
70° INTENSIVE
AUTO DAILY
60° QUICK
45° GLASS
PREWASH

50° ECO
PLATE WARMER
AUTOMATIC
70° INTENSIVE
55° SHORT
20 MINUTES
EAT-LOAD-RUN
Very dirty pots and dishes
daily use. Automatically adjusts times, temperatures and consumption according to the quantity and dirtiness of dishes.
normally dirty dishes with minimum consumption
fragile glasses and dishes
not very dirty dishes
daily use, washing at 65°C
rinse dishes awaiting subsequent complete washing
warm the dishes before taking them to the table or for removing the dust from dishes that have been in the cupboards for a long time
reduced load of dishes used daily
It is advisable to place a teaspoon of detergent in the WRD container
Select possible required options
Before starting the program make sure the spray arms turn freely
Press OK-START to start the program
The program is finished. You can switch off the dishwasher
The dishwasher is in demo mode.
Options and menus
Childlock, keyboard safety lock
Childlock is selected
Childlock is deselected
Childlock is active. You can deactivate it by pressing any key for 5 seconds and modifying the relevant option.
You can delay the start of the program by 1 to 19 hours. Select the required time and press OK-START
You have selected delayed start
The count-down has started
Special sanitizing option.
The option has been selected
The option has been deselected
Add an extra rinse
You have selected the extra rinse
You have deselected the extra rinse
With the program selected you cannot add the extra rinse
The profile of the wash programs is adapted to optimize results according to the detergent selected
You have selected "Normal Detergent"
You have selected "3in1 Detergent"
You have selected "BIO Detergent"
You have selected "4in1 Detergent"
Reduce drying time
You have selected Eco drying
You have selected normal drying

You can adjust the volume of all the acoustic signals
The required volume has been stored
You can activate or deactivate rinse aid dispensing. The modification is valid only if you have selected the 3in1 detergent option.
Rinse aid dispensing is selected
Rinse aid dispensing is deselected
You can adjust the water softener according to water hardness
The required water hardness has been stored
You can adjust the display contrast
The required contrast has been stored
You can adjust the display brightness
The required brightness has been stored
The option selected is not available with this program
Press OK-START to select the options displayed in sequence
Press OK-START to confirm the selection
Alarms
Attention: the dishwasher is not filling with water. Make sure the water cock is not closed and that the filling pipe is not constricted.
Attention: the dishwasher is not draining the water. Make sure the drain pipe is properly connected and not bent, and that the sink drain is not blocked.
Attention: the antiflood system has been activated
Attention: there may be a fault in the water recirculating pump
Attention: there may be a fault in the water heating device. The program has been zero-set
Press OK-START to resume program execution. If the alarm occurs again.
Close the water cock, switch the dishwasher off and contact Assistance Service
Cancel
You have cancelled the previous selection. You can make a new one.
You have cancelled the program
You have cancelled the delayed start

4 WASHING

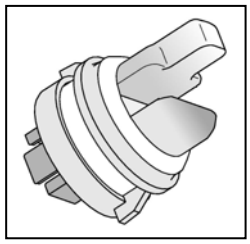
4.1 Wash programmes

Type	Programme	Prewash (°C)	Wash (°C)	No. of rinses	Possible options							Min. ~
					Half load	Sanitize	3 in 1	Extra rinse	Bio detergent	"Tablet"	Eco drying	
I2	**Intensive (*maximum speed*)**	55	68	2	☺	☺	☺	☺		♦	☺	120'
I3	***Short* Intensive**	50	68	2	☺	☺	☺	☺	☺	♦		88'
N2	**Normal (*maximum speed*)**	--	68	1	☺	☺	☺	☺		♦	☺	100'
N3	**Delicate**	--	55	1	☺	☺	☺	☺	☺	♦	☺	98'
N4	**Delicate without prewash**	--	55	1	☺	☺	☺	☺	☺	♦	☺	89'
N5	**Normal 3 rinses**	--	68	2	☺	☺	☺	☺	☺	♦	☺	102'
N6	**Normal 3 rinses without prewash**	--	68	2	☺	☺	☺	☺	☺	♦	☺	93'
E1	**Axx Energy label**	--	60 max	1	☺	☺	☺	☺	☺	☺	☺	162'
E4	**Fast Energy label**	--	55 max	1	☺	☺	☺	☺	☺	♦	☺	134'
E5	**Auto performance Energy label**	--	65 max	1	☺	☺	☺	☺	☺	☺	☺	141'
Auto	**Auto 50-65°C**	--	50-68	1		☺	☺	☺	☺	♦	☺	92'-115'
Q1	**Short**	--	50	1		☺	☺	☺	☺	☺		52'
Q4	**Soak**	--	--	--			♦		♦	♦		12'
Q5	**Short 30 min**	--	65 max	--		☺	☺	☺	☺	☺		31'
Q6	**Heat plates**	--	--	--			♦		♦	♦		30'
Q7	**Glassware**	--	45	1			☺	☺	☺	♦	☺	71'

NB: The number and types of wash programmes vary with the configuration of the model.

4.1.1 Automatic programme

❖ **Turbidity sensor**



Some models fitted with a turbidity sensor can be equipped with a special "Automatic" programme that optimises the cycle to compensate for the quantity of dishes loaded and the amount of dirt on them. The sensor is located on the outside of the sump and directly contacts the water.

The NTC sensor that controls wash water temperature and the infrared turbidity sensor that checks the turbidity of the water (and thus the amount of dirt deposited on the dishes) are contained in a single component.

❖ **Detection of dirtiness**

The degree of turbidity is measured during the cold prewash.

A LED powered by the main board (connector H5) projects a beam of light at a photo receiver.

In the photo receiver circuit (connector H6 on the main board), a current circulates that is proportional to the amount of light received (and is thus inversely proportional to the degree of turbidity).

The microprocessor measures the signal in the circuit and determines the most appropriate cycle for the amount of dirt dissolved in the water.

❖ **Detection of load**

The quantity of dishes loaded (full or 1/2 load) is detected during the first heating phase in the washing cycle by measuring the speed of water temperature increase (NTC sensor, connector H8).

- **Full load:** when the slope of the curve is less than the programmed standard threshold
- **Half load** when the slope of the curve is greater than the programmed standard threshold.

Phases in the automatic programme

Shown below are the variations in programme phases which are made as a function of dirt level and load.

Type		Phases in the programme					
Load	Very dirty?	Prewash	Wash	First rinse	Second rinse	Hot rinse	Drying
Full	Yes	cold	68° C	cold	cold	68° C	24 min.
Full	No		55° C		no		
Half full	Yes		55° C				
Half full	No		50° C				

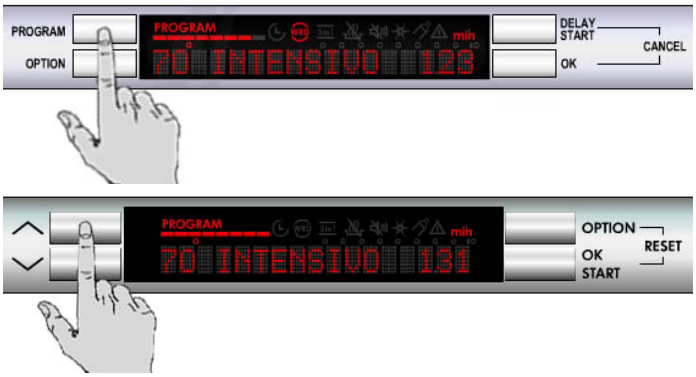
4.2 Selecting a programme

1. Open the door and turn the appliance on by pressing button **S0**
   - The LCD display lights up in one of the following situations:
     - A welcome message appears and the appliance is in selection mode
     - A welcome message appears and then the last programme run flashes (to run this programme again, skip to point 4)
     - Only at first switching on the language choice is required and after setting it, the appliance in in selection mode

2. To select a programme:
   a) press once or more the button relative to programme selection (till the LCD shows the desired programme)

   or

   b) press once or more the buttons to scroll up and down the programme list (till the LCD shows the desired programme)



3. The following then appears on the LCD:
   - The name of the programme, which flashes
   - The time in minutes from the beginning to the end of the cycle
   - Segments at the top of the display, in the same number as the number of washing phases in the programme selected
   - The symbols that characterise the programme

4. Press the “OK/START” button to confirm the choice and start the cycle

5. At this point, the LCD will display advisories/alarms, for example, such as no salt and/or no rinse-aid in the machine. Correct the problems displayed. If the 3-in-1 detergent option has been chosen, the no rinse-aid advisory is disabled

6. Press the “OK/START” button again and close the door to start the programme.

4.2.1 Cancelling a programme

To cancel a programme after it has been started:

1. Open the door carefully
   - The LCD shows the message “Close the door”
2. Simultaneously press the buttons associated to the “Cancel” function:
   - The LCD shows the message “Interrupt?”
3. Press OK/Start button
   - the machine sets itself to the cycle selection mode with “Set the programme” on the display
4. At this point, a new cycle can be selected by following the instructions reported above

NB: If the cycle has not yet been started and the door is open, all the selections made can be changed by pressing the proper buttons.

4.2.2 Interrupting a programme

To interrupt a programme in progress:

1. Open the door carefully

↳ By reclosing it, the cycle resumes, with a short delay, from the point at which it was interrupted.

or

2. Open the door carefully and switch the appliance off with **S0** button

↳ Press button **S0** once again. The cycle resumes from the point at which it was interrupted.

NB: “Close the door” appears on the display while the door is open

Important: If the appliance is turned off or the door is opened for more than 30 seconds during the drying cycle, the cycle will end after the regeneration phase and the appliance will be set to the cycle selection mode when the machine is turned back on (the last cycle run will flash on the LCD).

4.3 Options

Every dishwasher with the EDW2500 control system is equipped with an “Options” button:

1. When Options button is pressed repeatedly, all available options are displayed in sequence
    - All available options are displayed on the LCD in sequence
    - The LCD shows the current setting for the option displayed
2. Press “OK/START” button to select the option to be modified
    - The LCD flashes the current setting for the option displayed
3. When Options button is now pressed repeatedly, all the available modifications for the selected option are displayed in sequence
    - The LCD flashes the new setting for the option displayed
4. Press “OK/START” button to confirm the new setting
    - The system now returns to the cycle selection mode

NB: If “Cancel” button is pressed repeatedly before point 4 is reached, the system exits the options mode and returns to the cycle selection mode, and no modification is made.

Here is a description of all the options available:

4.3.1 Eco-drying:

this option must be selected every time it is desired, and its availability depends on the duration of the cycle that will be run. The option is selected by pressing the relative button, and the relative icon then appears on the LCD. It is available in all programmes with at least 15 minutes of drying time (excluding “Short Intensive”, “Short”, “Short 30 min”, “Soak” and “Heat plates”):
Drying time is reduced to only 15 minutes
“Energy Label” programmes are shorted by 39 minutes; all other programmes are shortened by 9 minutes

4.3.2 Extra rinse:

this option must be selected every time it is desired. When it is selected, the relative icon appears on the LCD. It can also be selected from the “Service” mode (see section 8). It is not available in the “Soak” and “Heat plates” cycles:
A rinse with pulse washing is added that lasts around 9 minutes.

4.3.3 Detergent

- **NORMAL**
- **“3 in 1”:** When this option is selected, it remains selected until it is disabled, and the relative icon appears on the LCD. The option modifies the phases in the programme to optimise performance when “3 in 1” detergent tablets are used. It is not available in the “Soak” and “Heat plates” cycles:
    - The programme length and the temperatures are specially varied to dissolve the detergent tablets
    - Water exchange (dilution drainage) is diminished)
    - Rinse-aid is not dispensed from the corresponding container
    - Regeneration (washing of resins) and salt are disabled from the corresponding container
- **“Bio”**: When this option is selected, it remains selected until it is disabled, and the relative icon appears on the LCD. The option modifies the phases in the programme to optimise performance when “bio” (organic) detergent is used and is available in all programmes:
    - The wash times and certain temperatures are increased (in all programmes except for “Soak” and “Heat plates”)

4.3.4 Rinse-aid:

When this option is selected, it remains selected until the setting is changed. Only when the “3in1” option is selected, in case of not satisfying drying results, it enables or disables the delivery of rinse-aid from the detergent dispenser. If delivery is disabled, the “Put the rinse aid” advisory does not appear on the display”.

4.3.5 Water hardness:

When this option is selected, it remains selected until the setting is changed. Using a sequence of water hardness values expressed in French degrees, the user can adjust the amount of water loaded into the machine between regeneration steps. The adjustment is subdivided into 10 levels. If the first level is set, the regeneration step is disabled and the “Put the salt” advisory does not appear on the display.

4.3.6 Language:

When this option is set, it remains set until the setting is changed. The language, in which the menus, programmes, options and advisories are displayed and heard, can be changed.

4.3.7 Buzzer volume:

When this option is set, it remains set until the setting is changed. The option is used to vary the volume of the buzzer and of the vocal messages from 0 to 5. The “buzzer disabled” icon appears on the display when the setting is “0”. The alarm vocal messages remain always active even if the selected level is “0”.

4.3.8 Brightness of LCD:

When this option is set, it remains set until the setting is changed. It is used to set the brightness of the back of the LCD from “0” (minimum setting) to “10” (maximum setting).

4.3.9 Contrast of LCD:

When this option is set, it remains set until the setting is changed. It is used to set the contrast between the back and the writings of the LCD from “0” (minimum setting) to “10” (maximum setting).

4.3.10 Delayed start:

This option enables the user to delay the start of the washing cycle and the relative options. A dedicated button is assigned to this option.

To select a “delayed start” time:

1. Close the door and turn the appliance on by pressing button **S0**
   - LED **L0** lights up
   - The LCD lights up with a welcome message and is then set to the cycle selection mode
2. Press the DELAY START button
   - The delayed start time flashes on the display
   - Every time the button is pressed, the delayed start time increases by 1 hour up to a maximum of 19 hours ***[1 hr – 2 hrs …..19 hrs…0 hr]***
3. Choose the programme and any options desired:
   - The time remaining to the end of the cycle appears momentarily on the display
4. Press “OK/START” button **O5** to confirm the settings
5. The “delayed start” time now begins:
   - The time set now appears steadily on the display while the icon on the third line flashes to indicate the countdown: the time decreases by hours ***[19 hrs – 18 hrs – 17 hrs …..1 hr]*** and then by minutes during the final hour ***[1 hr - 59 min – 58 min… 0]***

NB: During the countdown (until the machine starts), the “delayed start” time can be changed or zeroed by pressing the DELAY START button.

6. When the countdown is over, the machine starts automatically.

NB: The delayed start time can be set after the wash programme has been selected.

4.4 Sequence of operations

SELECTING THE CYCLE	1. Open the door and press **S0** button**:** ↳ The LCD display lights up with a welcome message
	2. Select delayed start if desired (see 4.3.10) and/or any desired options
	3. Select the desired programme The following appears on the LCD: ↳ The name of the programme ↳ The time from the beginning to the end of the cycle, in minutes ↳ The number of segments corresponding to the number of phases in the selected wash cycle ↳ The symbols that characterise the programme
START	4. Press the "OK/START" button and close the door If delayed start has been selected: ↳ The countdown starts: The time decreases by hours ***[19 hrs – 18 hrs …..1 hr]*** and by minutes during the final hour ***[1 hr - 59 min – 58 min… 0]*** ↳ When the countdown is over, the machine starts automatically
RUNNING OF THE CYCLE	5. During the cycle, the Beam on Floor, if featured, will project a beam on the floor NB: The time to the end of the cycle decreases by minutes and is updated at the beginning of every new phase in the cycle.
CANCELLING/INTERRUPTING THE CYCLE	6. To <u>interrupt a programm in progress</u>: ↳ Open the door carefully or ↳ Switch the appliance off with **S0** button NB: To restart the programme, close the door and/or press button **S0** once again
	7. To <u>cancel a programme</u> in progress: ↳ Open the door carefully ↳ Simultaneously press the buttons associated to "Cancel" function ↳ The display shows the message "Interrupt?" ↳ Press the "OK/START" button to confirm cancellation
END	8. At the <u>end of the programme</u>: ↳ The buzzer sounds a number of times ↳ The Beam on Floor, if featured, will switch off ↳ The display shows **END OF CYCLE** and **SWITCH OFF**
	9. Press button **S0** to turn the appliance off

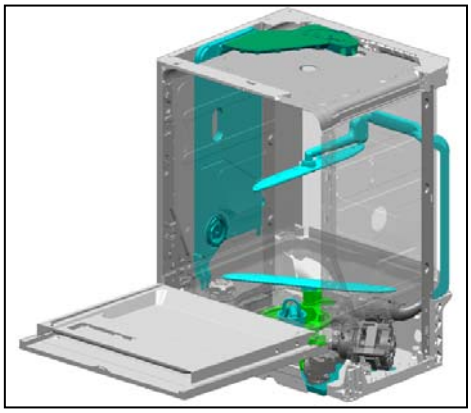
5 BUILD CHARACTERISTICS

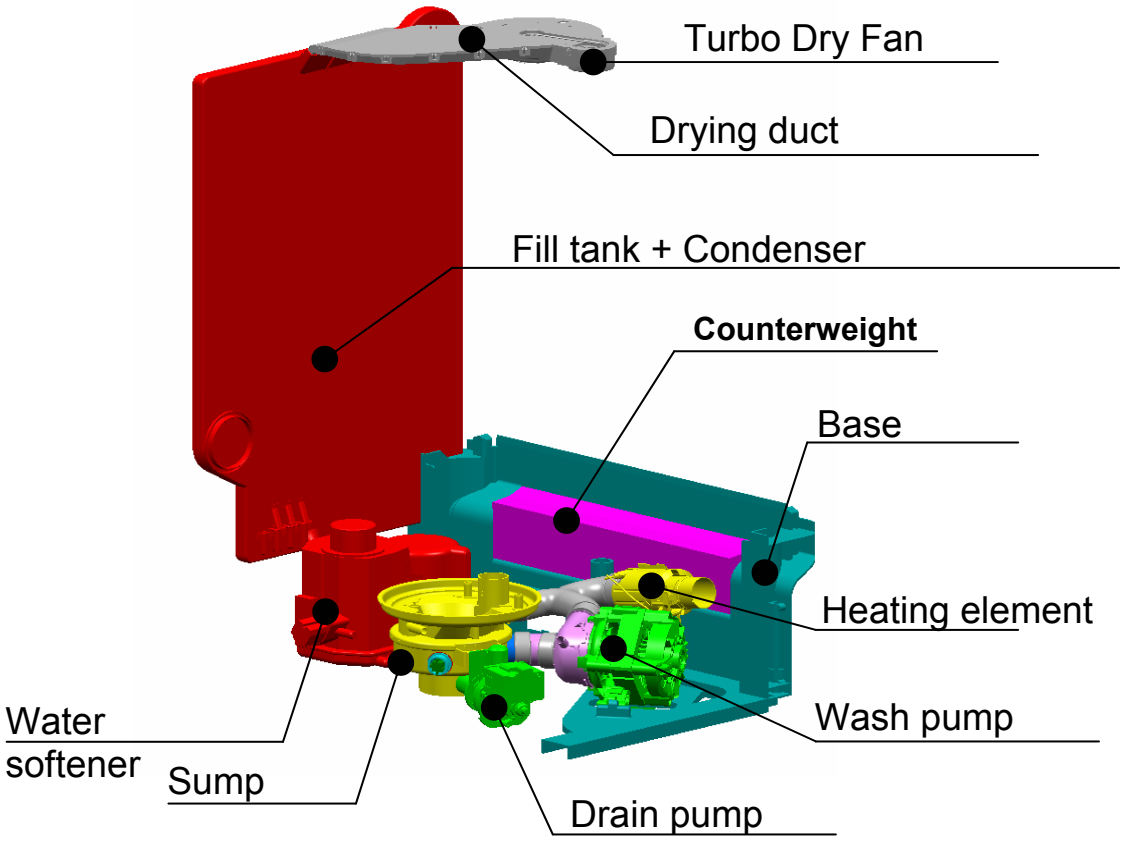
5.1 Structure

The appliance can be subdivided into four main assemblies:

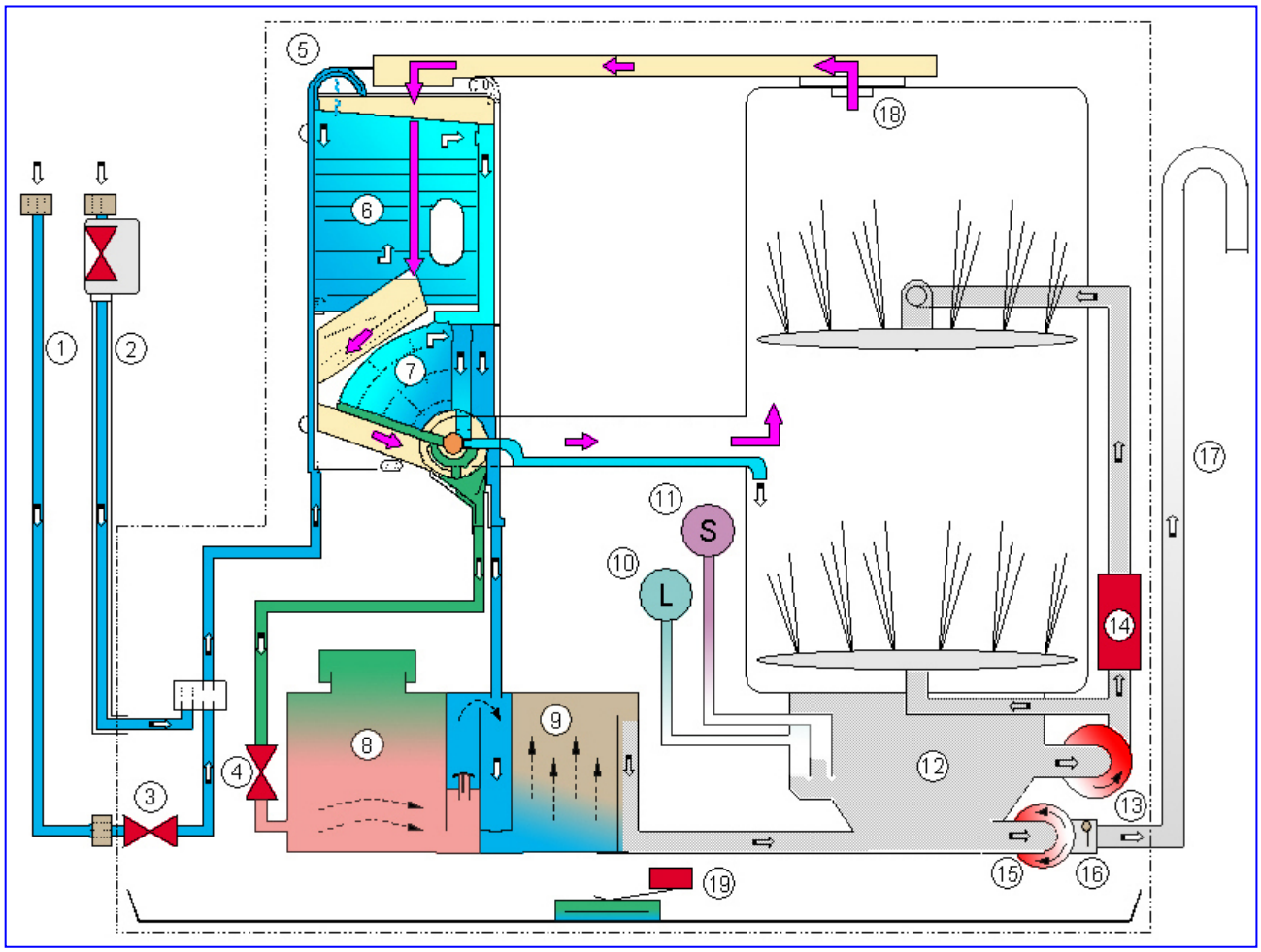
- BASE AREA – DOOR AREA – TUB AREA – WATER UNIT

The machine is housed in an assembly of individual removable parts composed of a front panel at the bottom and two side panels.





5.2 Hydraulic circuit



LEGEND

1 - Fill hose	11 - Anti-overflow pressure switch
2 - Fill hose with "Acquacontrol" device	12 - Sump assembly
3 - Fill solenoid	13 - Wash pump
4 - Regeneration solenoid	14 -Tube-enclosed heating element
5 - Air break	15 - Drain pump
6 - Steam condenser	16 - Non-return valve
7 - Regeneration chamber	17 - Drain hose
8 - Salt tank	18 - Drying duct/fan
9 - Resin tank	19 - Anti-flooding device
10 - Level pressure switch	

6 ELECTRICAL COMPONENTS AND FUNCTIONS

6.1 EDW2503 Electronic control system

The EDW2503 electronic control system consists of:

- One central display board with LCD and uses a separate ON/OFF button.
- One main board (fig. A) placed in the lower part of the appliance, anchored to the base by a plastic support (as for appliances “DIVA” EDW2000/2003/2500).

The “Talkie” version features also an electronic board, placed under the control panel and contained in a plastic box, specific for the voice control and connected electrically to the speaker positioned on the inner door.

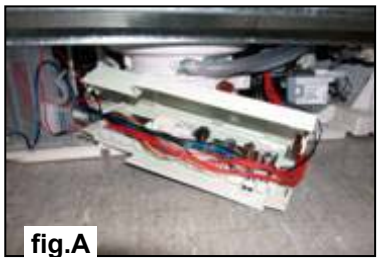
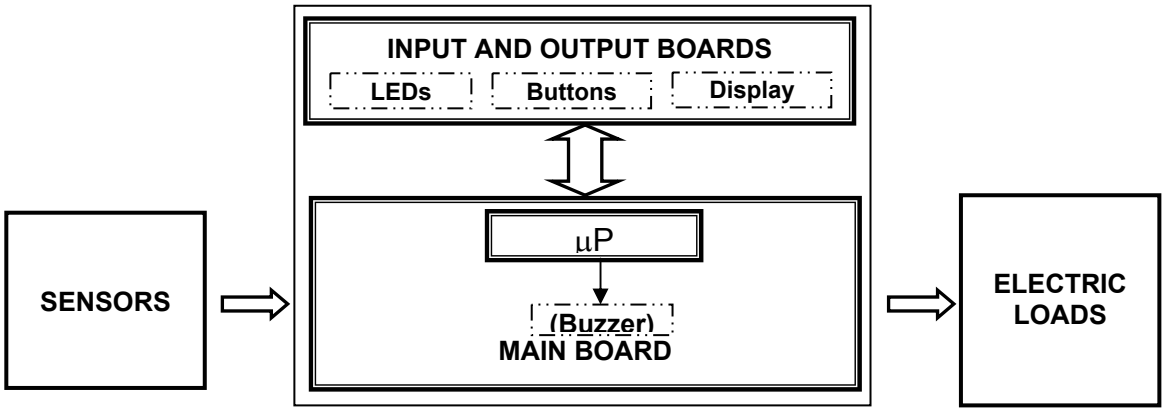


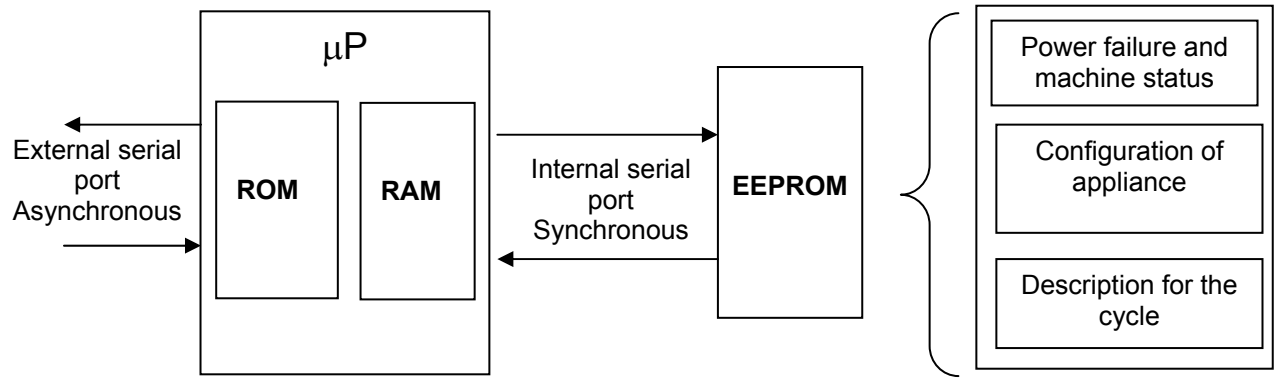
fig.A

6.1.1 Functions performed by the mother board



- ⇨ Acquires cycle programming and commands through the input and output boards.
- ⇨ Powers all the electrical components (solenoids, wash pump, detergent/rinse-aid dispenser, drain pump, heating element, fan motor)
- ⇨ Controls the temperature of the wash water using a signal from an NTC sensor, and controls the speed of the wash pump using a signal from a tachometric generator.
- ⇨ Monitors the pressure switches and the rinse-aid / salt sensors.

6.1.2 Memories contained in the electronic control system



The main board is equipped with an EEPROM that is external to the microprocessor and which is used to store data on machine configuration, programming for the cycle, and status of the cycle in case of a power failure or alarm.

The configuration data is programmed at the factory by a computer with a DAAS interface. This data determines the operation of the appliance (number and types of programmes, options, LEDs, etc).

6.1.3 Power failures

The “Power Failure” function stores information on the status of the cycle during a power failure so that when the power is restored, the cycle can resume from the point at which it was interrupted. *If the appliance is in the drying phase when a power failure occurs*, *the cycle will end after the regeneration phase*

6.2 Electrical specifications

6.2.1 Components

TYPE OF COMPONENT	POWER RATING	TYPE OF CONTROL
Wash pump	Max 250W	Triac
Drain pump	Max 100W	Triac
Heating element	Max 2100W	Relè
Water fill solenoid	Max 10W	Triac
Regeneration solenoid	Max 10W	Triac
Detergent and rinse-aid solenoid	Max 10W	Triac
Fan motor	Max 10W	Triac

6.2.2 Sensors

SENSOR	TYPE OF SIGNAL	TYPE OF COMPONENT
Salt sensor	Digital, 5 Volts	Reed
Rinse-aid sensor	Digital, 5 Volts	Reed
Temperature sensor	Analogue, 5 Volts	NTC
Turbidity sensor (on certain models, only)	Analogue, (12 Volts, max)	Opto-electronic
Tachometric sensor	Frequency	Tachometric generator
Level sensor	Digital, High voltage	Pressure switch
Door closure sensor	Digital, High voltage	Switch
Anti-flooding sensor	Digital, High voltage	Switch

*** NTC Temperature Sensor**

* **NTC** COMPARISON TABLE		
Temperature °C	⇨	**Nominal value Ω**
10	⇨	9655
25	⇨	4850
60	⇨	1205
90	⇨	445

6.3 Power feed and selection of programmes

The main board is powered directly by the terminal board. The connectors involved are E3 (neutral) and E1 (line).

The control/display board (user interface) is powered by 5V supplied by the main board, so programmes can be selected when the main board is turned on.

When the door is closed, the input board detects the closed contacts on switch (IP) between connectors F1-F3 and starts the wash programme. The same switch supplies power to the electrical components.

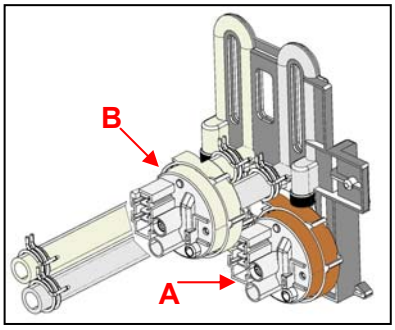
When the door is opened, power is shut off to the various loads and the cycle is paused.

7 Water filling

7.1 Fill circuit

7.1.1 Pressure switches on fill level and anti-overflow system

- The level of water during filling is controlled by level pressure switch (A)
- The anti-overflow pressure switch (B) makes sure that the level of water during filling does not exceed the safety threshold (overflow through the door).



7.1.2 Fill system

The fill solenoid is powered by triac on the circuit board (connector A1) through the door switch (IP) and the anti-flooding microswitch (DA).

The water level in the sump is controlled by pressure switch (RL). The circuit board constantly monitors the status of the pressure switch through the “sensing” line connected to connector E1:

⇨ “EMPTY” if contacts 1-2 are closed
⇨ “FULL” if contacts 1-3 are closed

7.1.3 Anti-flooding device

When the anti-flooding device is tripped, contacts (DA) on the relative microswitch open and cut off power to the water fill solenoid.

7.1.4 Anti-overflow system

If the pressure switch (PA) on the anti-overflow system is activated, the closed “FULL” contact (1-3) starts the drain pump (PS), which operates until the contact switches to “EMPTY” (1-2).

⚠	If the **door is opened** or the machine is **shut off**, the drain pump shuts off.

7.2 Control of water filling

The quantity of water required to perform the washing cycle is exclusively determined by the closure of the electrical contacts in the pressure switch when it switches from EMPTY to FULL.

In order to keep a constant amount of water in the machine, if the pressure switch should re-open to EMPTY, fresh water is introduced until the switch returns to FULL. The fill cycle is subdivided into the following sub-cycles:

7.2.1 Static filling

With the motor switched off, the fill solenoid is activated and water is introduced into the appliance until the pressure switch switches to FULL

7.2.2 Dynamic filling

Dynamic filling is obtained by starting the wash pump, which moves the pressure switch to the EMPTY position. At this point, the fill solenoid is actuated and water enters until the pressure switch moves to the FULL position.

The speed of the motor determines the quantity of water loaded into the machine: the electronic control system actuates the wash pump at a speed that depends on the type of washing that will be executed after the machine fills:

- ⇨ If washing is «**ctrl**» (constant speed): the motor is gradually accelerated to **2800 RPM**.
- ⇨ If washing is «**PW**» (pulse): the motor is gradually accelerated to **1900 RPM**.

N.B.- For more information on these washing methods, see the table of wash programmes.

7.2.3 Level control during washing

The water circuit operates with greatest efficiency when the pressure switch remains constantly on FULL, since the water contained in the sump enables the pump motor to operate constantly and without the fluctuations that are caused when the pump cavitates.

The fill solenoid is disabled when the pressure switch is set to FULL.

7.3 Water filling time

The maximum time that the fill solenoid stays open is subdivided over the various sub-phases in the fill cycle.

7.3.1 Static filling time

S.T. = max 90 seconds: this is the maximum time allowed for the pressure switch to switch to FULL. If the switch does not move to FULL within the established time, the electronic control system signals an alarm [**1 0**] and interrupts the washing cycle.

7.3.2 Dynamic filling time

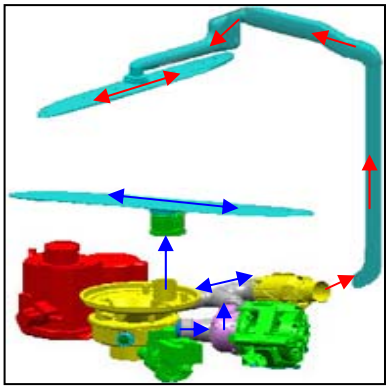
D.T. = S.T. x 3: this is the maximum time allowed for the pressure switch to switch to FULL during the entire fill phase.

- If the pressure switch does not switch to FULL within the time allowed (**S.T. x 3**) the electronic control system shuts off the fill solenoid and the heating element (if it is on), and then completes the washing cycle. When this occurs, alarm [**F0**] is stored internally but is not shown to the user. The alarm can only be displayed to the service technician through a specific procedure.
- During dynamic filling at 2800 RPM, if the pressure switch fails to switch to the FULL during the first 60 seconds, the electronic control system signals an alarm [**1 0**] and interrupts the washing cycle.

7.3.3 Interruption of water filling

If the fill cycle is interrupted by opening the door or by a power failure, the elapsed time up to that point is stored. When the door is closed or power is restored, water filling resumes from the point of interruption and the operating time from that point is added to the previous time.

7.4 Washing system



This appliance features the conventional washing system in which mechanical washing action is obtained from the wash pump, which circulates water through the water circuit and rotates the two spray arms simultaneously.

The wash pump, which is equipped with a tachometric generator, is powered by an asynchronous motor equipped with a starting capacitor (3µF – 450V).
The motor rotates anti-clockwise (as seen from the side of the impeller).

To optimise washing performance, this appliance offers two different washing systems:

- «**ctrl**» ⇨ Washing at a constant motor speed of 2800 RPM.(max. motor speed).
- «**PW**» ⇨ Variable-speed (pulse) washing at 1600 > 2800 RPM. This system is controlled by the electronic control system, which sequentially activates the washing motor at two different speeds (a minimum and maximum speed) for brief intervals.

MOTOR SPEED		PERIOD OF TIME	
Normal	*1600 RPM*	⇨	*4 sec*
Pulsation PW	*2800 RPM*	⇨	*0.8 sec*

*The motor speeds for «**ctrl**» and «**PW**» can be programmed; for further information, see the table of cycles for the specific model.*

7.5 Level control during washing

When the fill phase is complete, the appliance shifts to the washing phase. During this phase, which is executed with cold or heated water, the status of the pressure switch is monitored constantly to ensure that the water system is operating efficiently, and the water level is topped up if necessary.

If the pressure switch returns to EMPTY during washing, the fill solenoid is activated for a maximum time of **S.T. x 3** (maximum total fill time).

If this time is exceeded, the washing cycle is completed but no more water is introduced. When this occurs, an alarm [**F0**] is stored internally but is not shown to the user. The alarm can only be displayed to the service technician through a specific procedure.

7.5.1 Control of wash pump

The wash pump (PL) is powered by the triac on the main board (connector F5-F7), through the door interlock switch (IP) and the start button (PU).

The main board controls the speed of the pump motor using the signal from the tachometric generator (T), which is connected across connectors G1-G2.

This signal is used for:

- Controlling washing systems *«**ctrl**» and «**PW**»*
- Controlling the safety systems on the pump motor, and the relative alarms
- Controlling dynamic filling

7.6 Heating

The heating element, which is enclosed in a tube, is used to heat the wash water (it does not operate during drying). The element is installed on the intake to the wash pump and is connected to the tube that feeds the upper spray arm.

The heating element (RR) is connected to relay on the main board (connector E2), the start button (PU), and the pressure switch controlling the fill system (RL), which must be set to FULL (contacts 1-3 closed).

Two safety thermostats are installed on the heating element:

- one thermostat resets automatically (and trips at 98ºC)
- the other is a fuse (that opens at 206ºC)

The temperature of the water is controlled by the main board using the signal from an NTC sensor (ST) connected to connectors H7-H8.

7.7 Built-in detergent dispenser

This dispenser consists of a plastic container divided into two separate compartments which contain detergent (**A**) and rinse-aid (**B**).

It is engaged by a single coil connected to a mechanical system that actuates both functions.

When the coil is activated, it moves a set of levers that engage the mechanism, which first delivers the detergent and then delivers the rinse-aid.

The dispenser coil (DD) is powered by the main circuit board through the triac (connector A3-A5) at the proper points in the cycle.

The circuit is closed through the contacts in the start button (PU) and the door switch (IP).

Some models are equipped with a rinse-aid sensor with a reed contact (SB) connected to connectors C3-C1 on the output main board.

If there is no rinse-aid, the reed contact is closed and the relative LED (on the interface board) lights up.

7.8 Draining

The drain pump (PS) is powered by the triac (connector B5-F7) through the contacts on the start button (PU) and the door switch (IP).

At the end of the drain phase, a check is made to verify whether the contact on the pressure switch is open (in the EMPTY position). If it is open, the cycle is allowed to move on to the next phase.

If malfunctions in the drain system keep the pressure switch stuck on FULL (presence of water in the water circuit), the drain phase is repeated.

After the drain phase is repeated, the electronic control system again checks the status of the pressure switch. If it is still on FULL, a drain failure alarm [i20] is signalled. The timeout for each of the two drain phases is 120 seconds.

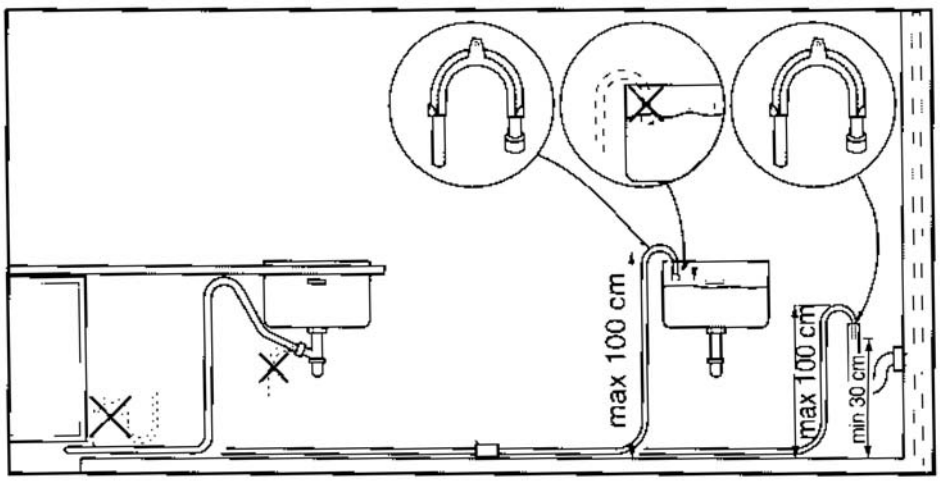
Note: Wash programmes always begin with a drain phase.

7.8.1 "Siphon" effect

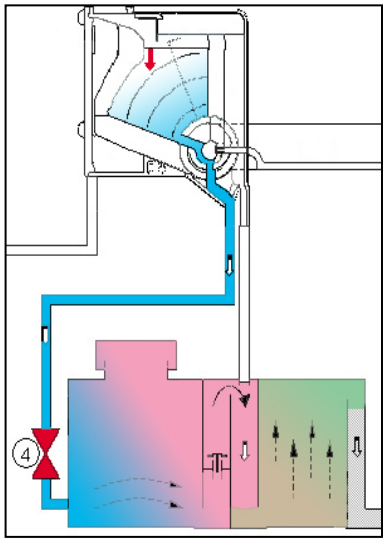
If the drain tube is incorrectly positioned, the so-called "siphon effect" may occur, in which case an alarm is displayed ***iF0 (see 9.1).***

The problem is particularly likely to occur during execution of the "declaration cycle": although the drain pump shuts down at the end of a drain phase, water continues to be expelled from the machine because the drain tube is incorrectly positioned. When this occurs, water loaded by the fill solenoid during the next fill phase is directly expelled, so the "full" contact on the pressure switch does not close before its "time out".

Thus, if alarm ***iF0*** occurs, it is a good idea to make sure the drain tube is correctly positioned as shown in the instruction manual



7.9 Regeneration system



Regeneration of the water softening system, which takes around **4** min, is usually performed at the start of the drying phase.

Every time regeneration is performed (with activation of regeneration solenoid **4**), the accumulation chamber is completely emptied of its contents (about 230 cc of water).

Regeneration is not carried out at every washing cycle, but at intervals that are determined by the programmed regeneration level:

- If regeneration level [**1**] is selected (no regeneration), regeneration is never performed and the "add salt" LED does not light up
- If regeneration level [**10**] is selected, regeneration is performed twice every cycle: at the end of the washing phase and at the beginning of the drying phase.

The regeneration solenoid (ER) is powered by the triac (connector F1-F3 on the main board) through the start button (PU) and the door switch (IP). Some models may be equipped with a salt sensor, whose reed switch (SS) is connected to connectors H1-H3 on the board.

If there is no salt in the machine, the contact closes and lights up the relative LED (on the display board).

7.10 Resin washing

The resins in the water softening system are washed at the beginning of every washing cycle. Salt water solution (regeneration water) remains in the resin container from the time the cycle is completed until the time next cycle is carried out.

If regeneration level [**10**] is selected, resin washing is carried out twice every cycle: at the beginning of the washing cycle and immediately after the regeneration procedure performed at the end of the final washing phase.

The sequence of phases is as follows:

a. Drainage for 30 seconds
b. Water fill to normal level
c. Water draining for 10 sec.
d. Water filling for 15 sec.
e. Complete draining

7.11 Regeneration levels

The count for “as needed” execution of the regeneration cycle is made by the electronic control system based on the duration of the fill phases and thus on the quantity of water loaded (and not on the number of cycles run).

The adjustment is made over 10 levels. If level [**1**] is selected, regeneration is not performed and the salt LED does not light.

Table of regeneration values

Level	Decalcifier setting		No. of acoustic signals	Water fill between regeneration procedures	Time regeneration solenoid opens	Hardndess of water trated	
	Manual	Electronic (LCD)		litres	sec	º F (TH)	º D (dH)
1	1	HARDNESS 0 7°T	1	- - -	0	0 > 7	0 > 4
2	1	HARDNESS 8 18°T	2	130	240	8 > 18	4 > 10
3	1	HARDNESS 19 25°T	3	94	240	19 > 25	11 > 14
4	1	HARDNESS 26 32°T	4	70	240	26 > 32	15 > 18
*** 5**	2	HARDNESS 33 39°T	5	53	240	33 > 39	19 > 22
6	2	HARDNESS 40 50°T	6	37	240	40 > 50	23 > 28
7	2	HARDNESS 51 64°T	7	20	240	51 > 64	29 > 36
8	2	HARDNESS 65 75°T	8	15	240	65 > 75	37 > 42
9	2	HARDNESS 76 90°T	9	10	240	76 > 90	43 > 50
10	2	HARDNESS 91 125°T	10	3	2x240	91 > 125	51 > 70

N.B.: In some stylings the representation of the decalcifier setting on the LCD is not expressed in French hardness degrees but in levels with the message “WATER HARDNESS 1”, “WATER HARDNESS 2”, …

7.11.1 "Blending" function

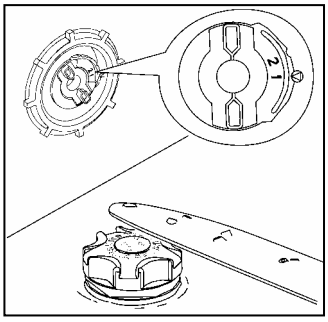
This function is performed inside the fill tank during the water fill phase. Depending on the position of the selector, softened water is automatically blended with the unsoftened water present in the appliance. The softened water is introduced from the softening system into the sump, while the unsoftened water flows (through the open by-pass valve) directly into the tank through the steam venting ring.

When the regeneration system is set to levels [**1-4],** it is advisable to activate the BLENDING function to mix softened water with unsoftened water.

This function optimises the consumption of salt, thus preventing corrosion of glassware when the water is very soft.

When the BLENDING function is activated, the percentage of unsoftened water introduced into the dishwasher is **15%**.

The BLENDING function is activated using the selector knob located inside the tub, on the left side, in the vicinity of the steam venting grille:



Position of selector

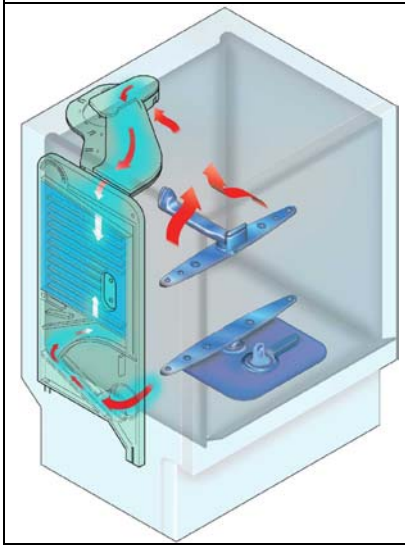
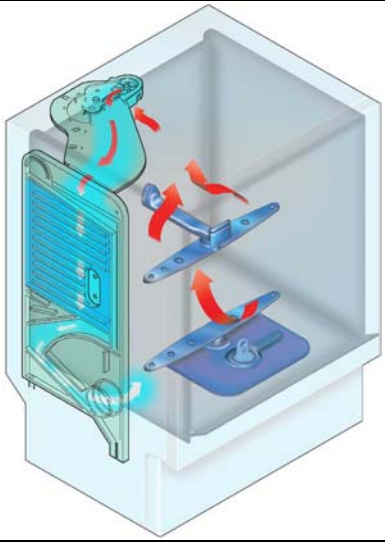
- ⇨ position **1** = blending enabled
- ⇨ position **2** = blending disabled

8 DRYING

In these dishwashers, the dishes are dried by a steam condensation process. This drying system is based on the natural circulation of the hot air produced during the hot rinse, when steam circulates inside the condenser on the fill tank.

The condenser is a (cold wall) condensation chamber filled with water, against which the hot air is ducted. This contact between the hot air and the cold wall generates a process of condensation.

The type of drying system can be either "activ-dry" or "turbo-dry", depending on the model of machine.

ACTIV-DRY	TURBO-DRY
	

8.1 "Turbo-dry" drying

On some models, a forced-air drying system is used. Steam is drawn in by a fan inside the upper duct and then ducted towards the condenser in the fill tank, from where it returns to the tub via the steam venting ring.

The fan motor (MV) is powered by the triac (connector D3 on the main board) through the start switch (PU) and the door switch (IP).

The drying time is variable and pre-defined for each washing cycle.

In some programmes, the fan operates for around 20 minutes after the end of the cycle. It shuts off (and will not restart) when the door is opened.

9 SERVICE

A single procedure is used to access the diagnostic mode, also known as the Service mode. Once this mode is accessed, the serviceman can:

- read / cancel alarms
- check the various components in the appliance for proper operation
- start a diagnostic cycle
- adjust the brightness and contrast of the LCD

In certain cases, when the user is not satisfied with washing performance, the serviceman can use a special procedure to select two supplementary options that improve performance:

- Extra rinse (cold)
- Disabling of pulse washing (PW), enabling of continuous washing (Ctrl)

9.1 Accessing the diagnostic mode

1. Open the door, press simultaneously and keep down buttons **Option and OK-Start**
2. Turn on the appliance using button **S0**
   ↳ The LCD turns on with the welcome message
3. The first message in the diagnostic mode appears
4. Press “Options” button repeatedly to scroll through the diagnostic mode:

Number of presses of button Options	LCD display	Function	Reference
--	*1 ERROR CODE i*	• Display of alarms stored in memory and activation of machine systems	See 9.2
1	*3 LED TEST*	• Test of all LEDs and the display • Cancellation of all alarms stored in memory	See 9.3
2	*4 LINE TESTS alternates with NUMERO CICLI XX*	• Selection of test cycle • Count of all cycles executed	See 9.4
3	*5 PULS WASHING YES*	• Enabling/disabling of pulse washing	See 9.5
4	*6 EXTRA RINSE NO*	• Enabling/disabling of extra rinse	See 9.6
5	*BRIGHTNESS 5*	• Brightness adjustment	See 9.7
6	*HARDNESS 40-50 °TH*	• Adjustment of regeneration level to suit water hardness	See 9.8

5. To exit the diagnostic mode:
   ❖ Press “Cancel” button until the system is set to the cycle selection mode

OR

   ❖ Turn off the appliance using button **S0**

9.2 Displaying alarms and activating individual components

1. Access the diagnostic mode (see 9.1)

2. Press button **Ok/Start** to begin displaying alarms:
   ↳ The display shows the last alarm that has occurred (to decode the alarm, see the table of alarms).
3. Press button **Ok/Start** once again to display the next to the last alarm that has occurred

4. Press button **Ok/Start** once again to display the third from the last alarm that has occurred

5. Press button **Ok/Start** repeatedly to scroll through the electronic components, as shown on the table below.

Presses of button Ok/Start	Display	Function activated
1	1 ERR CODE i 0	⇨ Displays last alarm that has occurred (for example, no alarm)
2	1 ERR CODE i 0	⇨ Displays the next to the last alarm (for example, no alarm)
3	1 ERR CODE i 0	⇨ Displays the third from the last alarm (for example, no alarm)
4	2 TEST ACTIVAT. 4	⇨ Activates regeneration solenoid
5	2 TEST ACTIVAT. 5	⇨ Activates drain pump
6	2 TEST ACTIVAT. 6	⇨ Activates water fill solenoid until full level is reached
7	2 TEST ACTIVAT. 7	⇨ Activates heating *(only with water at full level!)*
8	2 TEST ACTIVAT. 8	⇨ Activates wash pump at 2800 RPM
9	2 TEST ACTIVAT. 9	⇨ Cycles detergent/rinse-aid dispenser
10	2 TEST ACTIVAT. 10	⇨ Activates drying fan *(if turbo-dry)*
11	2 TEST ACTIVAT. 11	⇨ Activates auto-dosing (currently not used)
12	2 TEST ACTIVAT. 12	⇨ Activates water hardness sensor (currently not used)
	Power is supplied to components when the door is closed. If no button is pushed within 60 seconds, the system automatically exits the diagnostic mode.	

NB: All functions can be accessed multiple times by pressing button **Ok/Start** repeatedly.

9.2.1 Table of alarm codes

When an abnormal situation occurs that may interfere with machine functioning, the main board activates a safety system which in most cases interrupts the washing cycle. The last three alarm situations are stored in memory. Using a special procedure, service personnel can display all the alarms stored in memory. The user is only shown four of the alarms.

The alarms are shown on the display and signalled with “beeps” from the buzzer (if machine is so equipped) or with vocal messages.

Type of alarm	Shown to user	Description of ALARM	Status of machine	Possible causes
i10	Yes **OPEN THE TAB**	**Water fill time-out** (the pressure switch has not switched to FULL within 90 sec. during static filling, or fails to switch to FULL during the first 60 sec. of dynamic filling at 2800 RPM)	The drain pump starts and then the cycle stops	Tap closed; Water mains pressure too low; Drain solenoid / wiring faulty; Pressure switch on water circuit plugged; Level pressure switch / wiring faulty; Faulty main board (short circuit on solenoid triac)
i20	Yes **PUMP BLOCKED**	**Water drain time-out** (the pressure switch has not returned to EMPTY after two drain phases lasting 120 sec.)	The drain pump starts and then the cycle stops	Drain circuit plugged / clogged; Drain pump faulty / obstructed (foreign bodies); Level pressure switch stuck on FULL (1-3); Pressure switch on water circuit plugged; Faulty wiring; Faulty main board.
i30	Yes	**Intervention of anti-flooding device** (drain pump operates)	The cycle stops and the drain pump starts.	Water leakage from tub – sump and various couplings (pumps, line to upper spray arm, etc.); Floating sensor jammed; Faulty microswitch; Fill solenoid jammed; Faulty main board (short circuit on solenoid triac); Faulty wiring.
i50	Yes	**Short circuit on motor triac** (wash pump operates continuously at maximum speed)	Water fills to operating level (if necessary), other mechanical systems fail to operate and cycle stops. The washing motor operates at max. speed and alarm is displayed.	Faulty main board
i60	Si	**Overheating** Temperature higher than 78°C	The cycle stops and the drain pump starts.	Faulty heating element; Safety thermostats (open); Wiring faulty; NTC-sensor (thermal contact faulty); Scarce circulation of water in the tub; Wash pump faulty (damaged impeller) Faulty main PCB

Type of alarm	Shown to user	Description of ALARM	Status of machine	Possible causes
i60	No	**Heating time-out** (heating is checked every 3 minutes: the temperature must increase by a certain value every time)	The programme is fully executed without heating (and with poor washing performance)	Faulty heating element; Safety thermostats have tripped (open); Faulty wiring; Faulty NTC sensor (poor thermal contact); Poor water circulation in tub; Faulty wash pump (impeller stripped) Faulty main board
i70	No	**Short circuited or open NTC sensor**	The programme is fully executed without heating (and with poor washing performance)	Faulty NTC sensor; Short circuit / open circuit in wiring; Faulty main board
i80	No	**Communication error between microprocessor and EEPROM**	Machine controls inoperative. **(*)**	Faulty main board
i90	No	**Improper software configuration**	Machine controls inoperative when unit is turned on. **(*)**	Faulty main board (Improper software configuration).
ib0	No	**Problem with turbidity detector** (if so equipped: calibration timeout)	The programme runs as though a "very dirty" situation were detected	Faulty turbidity sensor; Faulty wiring to sensor; Faulty main board
id0	No	**Problem with washing motor: no signal from tachometric generator** (wash pump operates, but there is no signal from the generator)	The heating element is disconnected; if the problem persists after timeout, the wash pump operates at max. speed and an alarm is recorded (the cycle continues)	Motor winding open / short-circuited; Motor jammed (foreign bodies); Faulty wiring to washing motor; Faulty motor capacitor; Tachometric generator open / short-circuited; Faulty main board
iF0	No	**Water additions time-out** (3 times length of S.T. time-out)	The cycle continues until the next phase with no added water and no heating. The fault is corrected after a drainage phase is completed.	Dishes overturned; Main filter clogged; Excessive foam; Poor seal on coupling between sump and pressure switch; Faulty pressure switch / poor connections; Domestic drain outlet improperly positioned (siphon effect, see 7.8.1)
i 0	No	No alarm has been stored.		

(*) If it is impossible to access the diagnostic mode, turn off and then turn on the appliance to see whether a temporary block has occurred. Before replacing the circuit board, make sure it is receiving power. Check the continuity of the power cable and the operation of the radio interference filter, make sure the contacts on the door interlock switch are closed, and verify the continuity of the wiring between connectors A2 / B1 on the board and the radio interference filter.

9.3 Cancelling alarms from memory

Every alarm should be cancelled after it has been read and after the appliance has been repaired. When the next diagnostic test is run, this will enable the serviceman to know whether the alarm has occurred again.

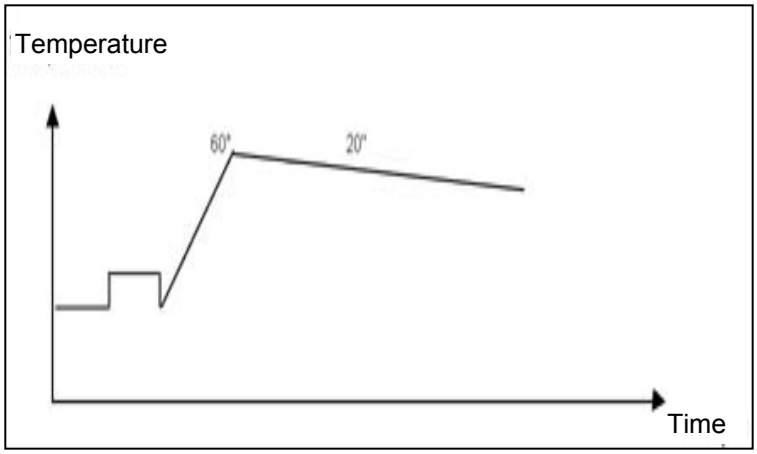
To cancel alarms:
1. Access the diagnostic mode (see 9.1)
2. Press button **Options** repeatedly until the following message appears on the display:
   - *3 LED TEST*
3. Press button **Ok/Start** to confirm
   - All the LEDs and the display flash for around 30 seconds
   - The buzzer sounds repeatedly for around 30 seconds
4. This function ends automatically with the machine setting itself to the cycle selection mode.

9.4 Test cycle

The test cycle is a shortened wash programme for use by service personnel only. It can be used to test all the functions in a traditional washing cycle. In effect, a normal cycle is simulated.

To run the test cycle:
1. Access the diagnostic mode (see 9.1)
2. Press button **Options** repeatedly until the following message appears on the display:
   - *4 LINE TESTS* alternating with *NO. OF CYCLES XX*
3. To start the cycle:
   - Press button **Options**
4. The programme starts:
   - The programme runs like a normal cycle, complete with all phases
   - All pause and cancellation functions are available

Phase	Duration
Water fill, Turbo enabled	30''
Water fill	25''
Pulse washing, dispenser opens	45''
Drain	dilution
Water fill	---
Pulse washing	60''
Drain	dilution
Water fill	---
Controlled washing at 2800 RPM, heating to 60°C	
Controlled washing at 2800 RPM, temp. maintained at 60°C	1200''



- *The total duration of the cycle is about 50 minutes.*
- *The resins are washed at the beginning of the first programme executed after the test cycle.*

9.5 Disabling / enabling pulse washing

Some programmes use a pulse washing (**PW**) system. The following procedure can be used to modify this system by substituting continuous washing «**Ctrl**» in all cycles where «**PW**» pulse washing is the default. This modification enhances washing action, even in delicate programmes.

To modify the wash cycle by disabling pulse washing:
1. Access the diagnostic mode (see 9.1)
2. Press button **Options** repeatedly until the following message appears on the display:
   - *PULSE WASHING YES* (when *SI* flashes, pulse washing is enabled)
3. Press button **Ok/Start** to toggle the setting
   - The word *NO* appears on the display (pulse washing is disabled)
4. To confirm:
   - Press button **Options**
   - OR wait 60 seconds
   - OR turn the appliance off by pressing button **S0**

9.6 Enabling / disabling an extra rinse

The following procedure can be used to include a supplementary rinse in all wash programmes, which improves rinsing action.

To add an extra rinse:
1. Access the diagnostic mode (see 9.1)
2. Press button **Options** repeatedly until the following message appears on the display:
   - *EXTRA RINSE NO* (when *NO* flashes, the extra rinse is disabled)
3. Press button **Ok/Start** to toggle the setting
   - The word *SI* flashes on the display (extra rinse is enabled)
4. To confirm:
   - Press button **Options**
   - OR wait 60 seconds
   - OR turn the appliance off by pressing button **S0**

9.7 Brightness

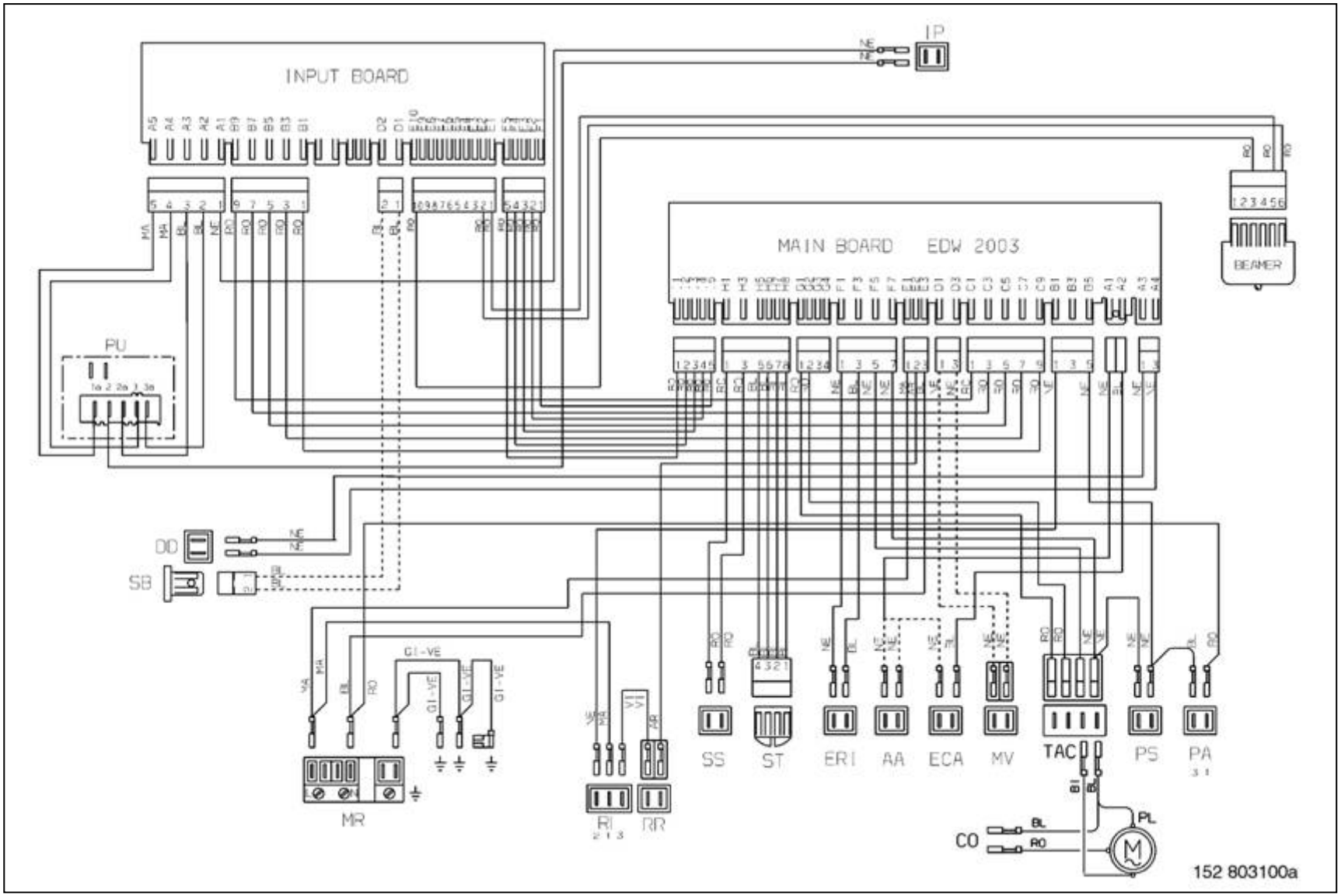
To adjust the brightness of the display:
1. Access the diagnostic mode (see 9.1)
2. Press button **Options** repeatedly until the following message appears on the display:
   - *BRIGHTNESS 5* (the number 5 flashes)
3. Press button **Ok/Start** repeatedly until the desired brightness is obtained on the display
   - The new brightness value flashes on the display
4. To confirm
   - Press button **Options**
   - OR wait 60 seconds
   - OR turn the appliance off by pressing button **S0**

9.8 Setting the water hardness

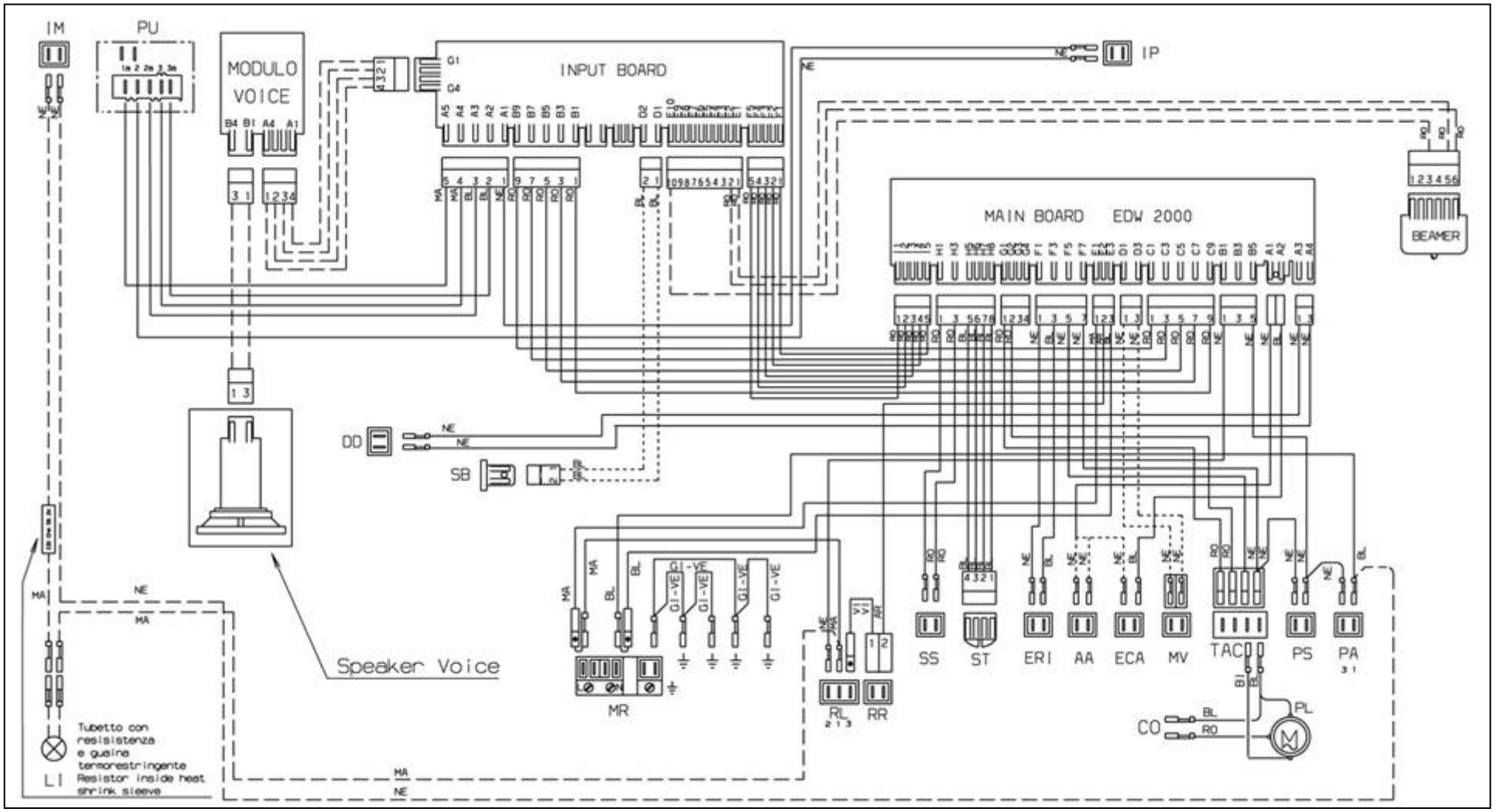
The count for “as needed” execution of the regeneration cycle is made by the electronic control system based on the duration of the fill phases and thus on the quantity of water loaded. This function optimizes this system to compensate for the hardness of the water. The adjustment is made over 10 levels, as described in section 6.11. If the lowest level of water hardness is set, regeneration is not performed and the advisory ADD SALT will not appear on the display.

To set the system to compensate for the hardness of the water:
1. Access the diagnostic mode (see 9.1)
2. Press button **Options** repeatedly until the following message appears on the display:
   - *WATER HARDNESS 1* (*1* flashes)
3. Press button **Ok/Start** repeatedly until the desired water hardness value appears on the display
   - The new water hardness value flashes on the display
4. To confirm
   - Press button **Options**
   - OR wait 60 seconds
   - OR turn the appliance off by pressing button **S0.**

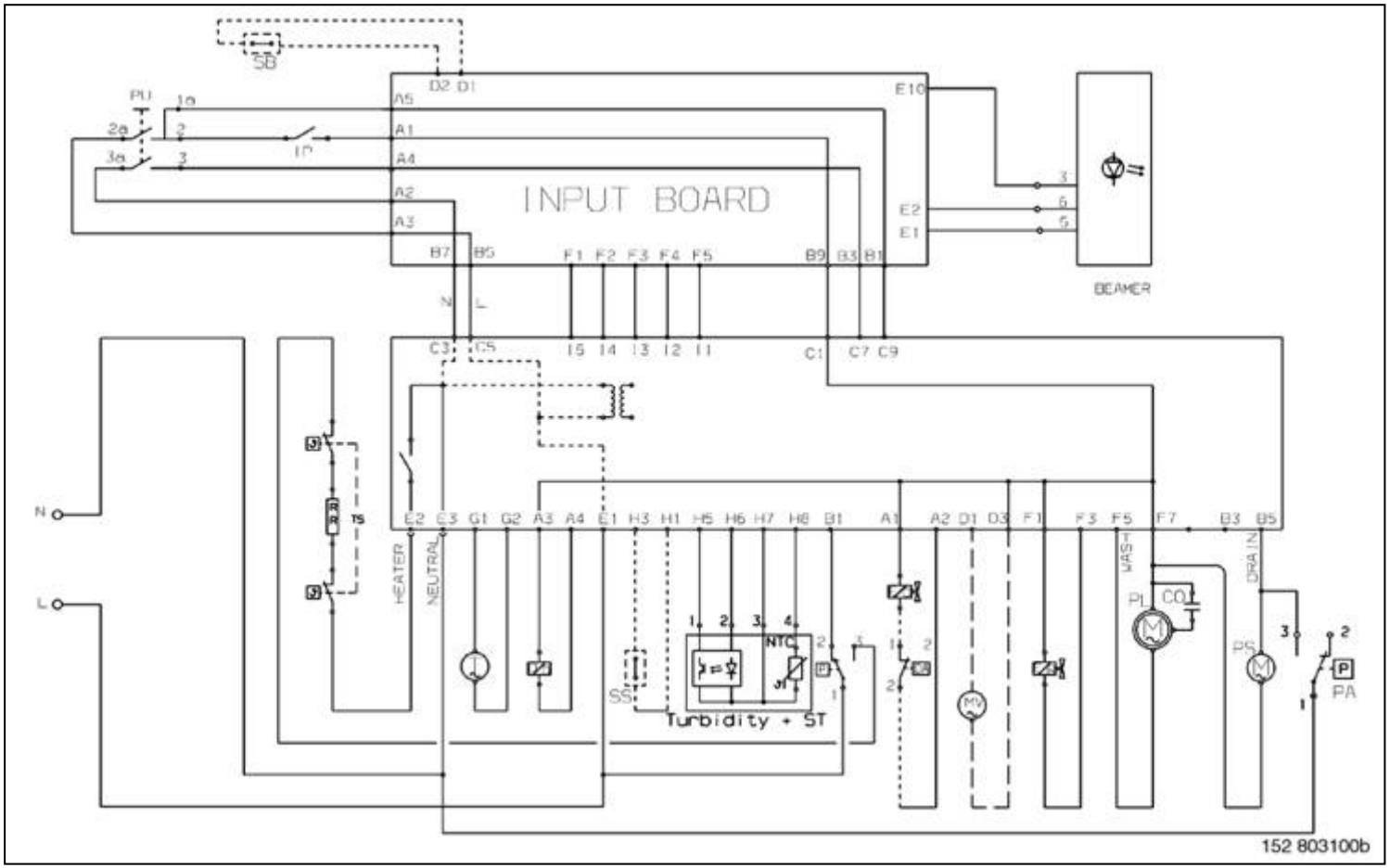
10 CIRCUIT DIAGRAM



10.1 “Talkie”

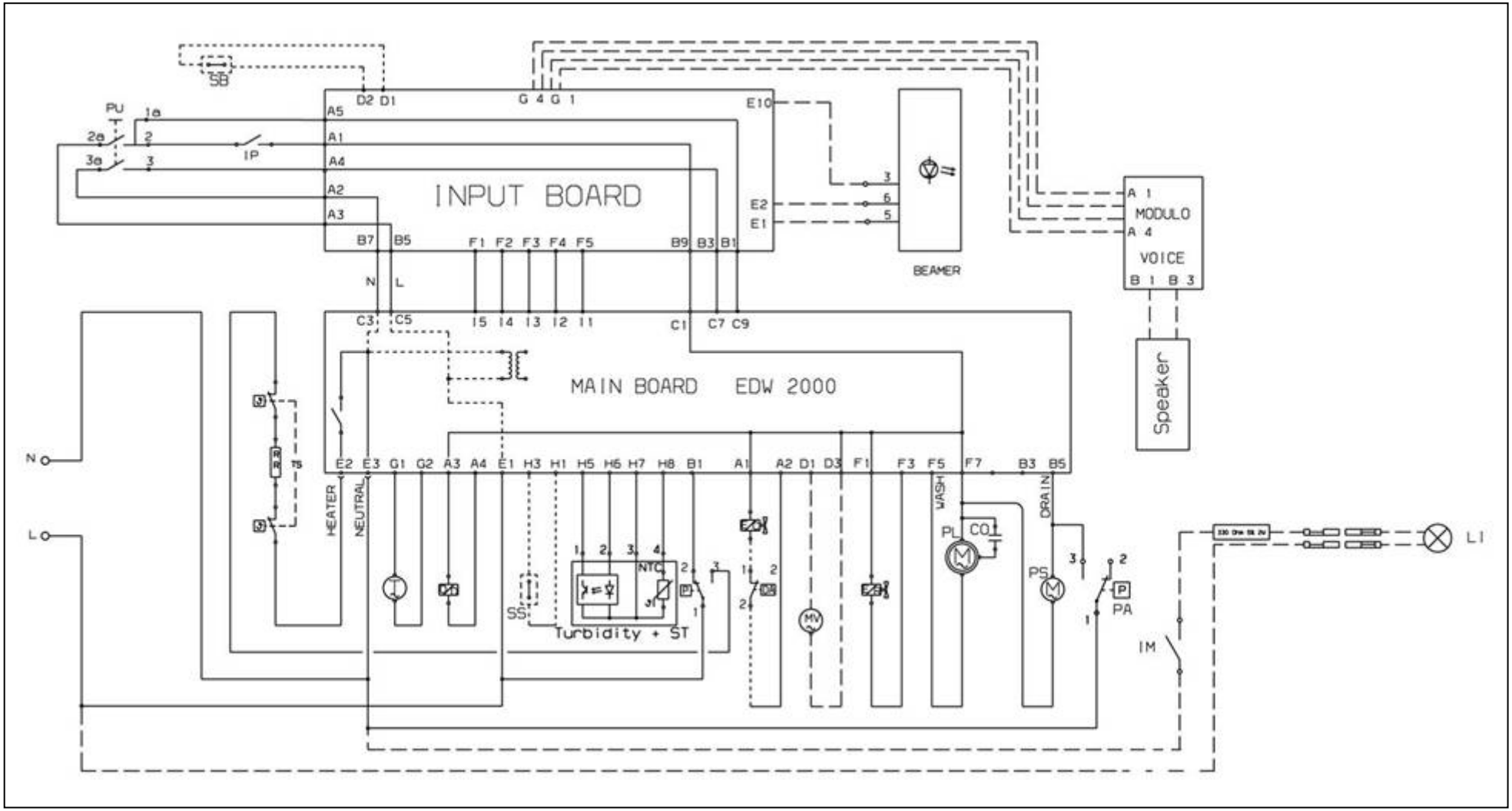

IM
PU
MODULO VOICE
INPUT BOARD
IP
MAIN BOARD EDW 2000
BEAMER
DD
SB
Speaker Voice
MR
RL
RR
SS
ST
ERI
AA
ECA
MV
TAC
PS
PA
CO
PL
LI
Tubetto con resistenza e guaina termorestringente
Resistor inside heat shrink sleeve

11 BASIC CIRCUIT DIAGRAM



AR = Orange **BI** = White **BL** = Blue **CE** = Light blue **GI-VE** = Yellow-green **MA** = Brown	**NE** = Black **RO** = Pink **VI** = Violet **AA/DA** = Anti-flooding device	**CO** = Capacitor **DD** = Detergent/rinse-aid dispenser **EC** = Fill solenoid **ER** = Regeneration solenoid **GA** = Interference filter **IP** = Door switch	**MR** = Terminal block **MV** = Fan motor **PL** = Wash pump **PS** = Drain pump **PU** = Button array **PR/RL** = Level pressure switch	**PA** = Anti-overflow level switch **RR** = Heating element **SB** = Rinse-aid sensor **SS** = Salt sensor Turbidity = Turbidity sensor **ST** = Temperature sensor	**TAC/T** = Tachometric generator **TS** = Safety thermostat **Main Board** = Main circuit board **User Interface** = Display board

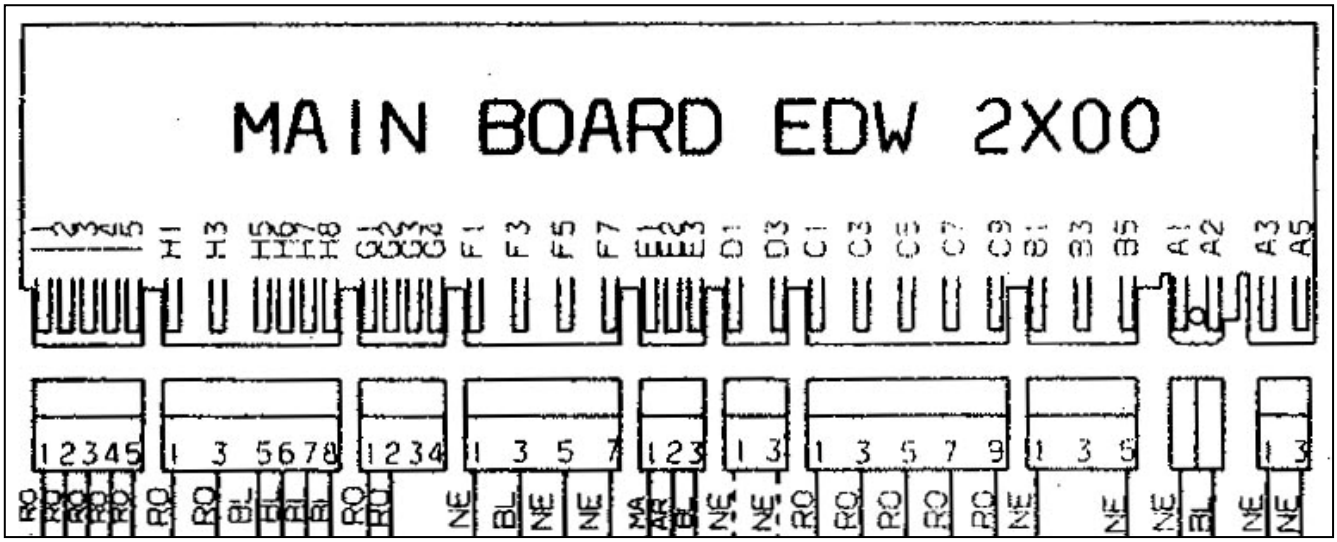
11.1 “Talkie”


INPUT BOARD
MAIN BOARD EDW 2000
MODULO VOICE
Speaker
BEAMER
Turbidity + ST
HEATER
NEUTRAL
WASH
DRAIN
PU
IP
PA
IM
PS
PL
CO
MV
NTC
SB
SS
N
L
LI

11.2 Checking components for proper operation

To make it easier to check components, a TEST PROCEDURE has been developed which indicates the points where tester probes should be applied and the correct theoretical value for each component.

- Access the electronic board positioned on the basement and detach all the connectors.
- Connect the probes of the tester to the appropriate points. Compare the electric resistance reading with the value shown on the table



Measurement points on circuit board wiring connectors:

LIST OF COMPONENTS	PROBE CONTACTS		CORRECT VALUES	NOTES
* POWER CABLE & (PU) - ON/OFF SWITCH	**L⇔E1**	⇨	**0 Ω**	*with ON/OFF button pressed*
	N⇔E3	⇨	**0 Ω**	
(RR) - HEATING ELEMENT + (TS) - SAFETY THERMOSTAT	**E1⇔E2**	⇨	**25 Ω ± 8%**	*connected in series (2100W)*
(PR) - LEVEL PRESSURE SWITCH	**E1⇔B1**	⇨	**INFINITE**	*on EMPTY (1-2)*
			0 Ω	*on FULL (1-3)*
(PA) - ANTI-FLOODING PRESSURE SWITCH	**B5⇔E3**	⇨	**INFINITE**	*on EMPTY (1-2)*
			0 Ω	*on FULL (1-3)*
(IP) - DOOR MICROSWITCH	**F1⇔F3 on the Input board**	⇨	**0 Ω**	*Door closed*
(DD/DB) - INTEGRATED DISPENSER	**A3⇔A5**	⇨	**1500 Ω ± 8%**	*OK*
(SB) - RINSE-AID SENSOR	**C1⇔C3 on the Output board**	⇨	**INFINITE**	*with Rinse-aid*
			0 Ω	*without Rinse-aid*
(SS) - SALT SENSOR	**H1⇔H3**	⇨	**INFINITE**	*with salt*
			0 Ω	*without salt*
(ST) - TEMPERATURE SENSOR	**H7⇔H8**	⇨	**4850 Ω ± 5%**	*(at 25ºC)*
			1205 Ω ± 5%	*(at 60ºC)*
(GT) - TACHOMETRIC SENSOR	**G1⇔G2**	⇨	**210 Ω ± 8%**	*OK*
(MV) - FAN MOTOR	**D1⇔D3**	⇨	**7750 Ω ± 8%**	*OK*
(ER) - REGENERATION SOLENOID	**F1⇔F3**	⇨	**6K Ω ± 8%**	*OK*
(EC) - FILL SOLENOID + (AA) - ANTI-FLOODING DEVICE	**A1⇔A2**	⇨	**3800 Ω ± 8%**	*connected in series*
(PL) - WASH MOTOR	**F5⇔F7**	⇨	**50 Ω ± 8%**	*start winding*
	To the two motor wires (blue) / (red)	⇨	**180 Ω ± 8%**	*auxiliary winding*
(PS) - DRAIN MOTOR	**B5⇔F7**	⇨	**180 Ω ± 8%**	*OK*

Note: - * = *Measurement points L and N refer to the pins on the plug fitted to the power cable.*
**** = Fill in about 4l water so that the level pressure switch is on full position.***

12 QUICK GUIDE

USER OPTIONS: Every dishwasher with an EDW2500 control unit is equipped with an “Options” button:

↳ Press options button repeatedly until the desired function appears on the display.

The table below contains a brief description of the special functions available to the user:

Option or Function	Method of selection		Method of activation		Short description / Comment (See 4.3)
⇩	Buttons	LCD	Buttons	LCD	⇩
Eco-drying	**Options**	ECO-DRYING NO *(with flashing NO)*	**Otpions (1)**	ECO-DRYING YES *(with flashing SI and symbol steadily lit)*	When button **Options** is pressed again, *NO* begins flashing again and the symbol disappears
Extra rinse		EXTRA RINSE NO *(with flashing NO)*		EXTRA RINSE YES *(with flashing SI and symbol steadily lit)*	When button **Options** is pressed again, *NO* begins flashing again and the symbol disappears
Detergent		Normal Detergent *(with flashing NORMAL)*		DETERGENT 3IN1 *(with flashing 3IN1 and symbol steadily lit)*	When button **Options** is pressed again, *BIO* begins flashing and the relative symbol appears. When button **Options** is pressed again, *NORMALE* begins flashing again and the symbol disappears
Rinse-aid dispensing		RINSE-AID YES *(with flashing YES)*		RINSE-AID NO *(with flashing NO)*	When button **Options** is pressed again, *SI* begins flashing again
Water hardness setting		HARDNESS 40-50 °T *(with flashing 40-50 °T)*		HARDNESS 51-64 °T *(with flashing 51-64 °T)*	When button **Options** is pressed again, the new hardness value flashes. N.B.: In some stylings the leveks 1, 2, 3, 4.. are displayed with the message “WATER HARDNESS 1”, … instead of the hardness values (40-50• for ex.)
Language		ENGLISH LANGUAGE *(with flashing ENGLISH)*		LANGUAGE ENGLISH *(with flashing ENGLISH)*	When button **Options** is pressed again, the next available language flashes
Buzzer		BUZZER VOLUME 1 *(with flashing 1)*		BUZZER VOLUME 2 *(with flashing 2)*	When button **Options** is pressed again, the new volume level flashes
Brightness		BRIGHTNESS 5 *(with flashing 5)*		BRIGHTNESS 6 *(with flashing 6)*	When button **Options** is pressed again, the new brightness level flashes

Press OK/START button to confirm the selection.

If “Cancel” button is pressed repeatedly without confirming a choice, the system will exit the diagnostic mode and enter the cycle selection mode. When this occurs, no programming parameter is changed.

If “Cancel” button is pressed for at least 6 seconds the default settings of language and brightness are reset.

(1) When button **Options** is pressed repeatedly, the selections available for the option under consideration appear in sequence.

NB: No “user” functions can be selected if a washing cycle has been selected (the unit must be in the pre-selection mode).

SERVICE OPTIONS: A single procedure is used to access the diagnostic mode, which is reserved for Service personnel:

- Press and hold down buttons **Options and Ok/Start** at the same time
- Turn on the appliance using button **S0**
  - The LCD display lights up with a welcome message
  - The first item in the diagnostic mode appears

When button **Options** is pressed repeatedly, the service functions available on the appliance appear in sequence.
The table below contains a brief description of the functions available to service personnel:

Option or Function		**Method of activation**		**Short description / Comment (See section 9)**
⇩	LCD	Buttons	LCD/Leds	⇩
Display of alarms and diagnostic test on components	1 ERR CODE i	**Ok/Start (1)**	1 ERR CODE i 0	When button **O5** is pressed a second and third time, the system displays the second and third alarm stored. When button **O5** is now pressed repeatedly, all the systems on the machine are activated in sequence (2 TEST ATTUAT 4…12…12).
Cancellation of alarms in memory	3 LED TEST		All the LEDs and the display light up for 30 seconds and the buzzer beeps at the same time	The appliance then switches to the cycle selection mode.
Test cycle	4 TEST LINE alternating with NUMERO CICLI XX		The test cycle begins. All steps in the cycle are displayed.	The appliance then switches to the cycle selection mode.
Pulse washing	5 PULSE WASHING YES *(with flashing SI)*		5 PULSE WASHING NO *(with flashing NO)*	When button **O5** is pressed again, *SI* begins flashing again
Extra rinse	6 EXTRA RINSE NO *(with flashing NO)*		6 EXTRA RINSE YES *(with flashing SI)*	When button **O5** is pressed again, *NO* begins flashing again
Brightness	BRIGHTNESS 5		BRIGHTNESS 6 *(with flashing 6)*	When button **O5** is pressed again, the new brightness level flashes
Water hardness setting	WATER HARDNESS 1		WATER HARDNESS 2 *(with flashing 2)*	When button **O5** is pressed again, the new hardness value flashes

To confirm the selection, press **Options**, OR wait 60 seconds, OR press **S0** to turn the appliance off.
NB: If “Cancel” button is pressed repeatedly without confirming a choice, the system will exit the diagnostic mode and enter the cycle selection mode. When this occurs, no programming parameter is changed.
(1) When button **Ok/Start** is pressed repeatedly, the options available for the function under consideration appear in sequence.

13 TABLE OF PROGRAMMES

The following table lists the steps in the programmes that are available on this type of appliance:

Programmes		Options							Prewash			Wash					Rinse			Extra rinse			Hot rinse		Dry.		
Abbreviation	Programme	Half load	Sanitize	3 in 1	Extra rinse	Bio detergent	"Tablet"	Eco drying	Heating (°C)	Wash time after heating (min.)	Type of washing	Heating (°C)	Wash time after heating (min.)	Heating (°C)	Wash time after heating (min.)	Type of washing	Wash time (min.)	Wash time (min.)	Type of washing	Wash time (min.)	Wash time after heating (min.)	Type of washing	Heating (°C)	Wash time after heating (min.)	Type of washing	Drying (min.)	Cycle time (min.)
I2	Intensive (max speed)	-	-	-	-	-	-	-	(ΔT) 55°C	ΔT +10'	ctrl	(ΔT) 55°C	ΔT +5'	(ΔT) 68°C	ΔT +14'	ctrl	2x3' (<65°C)	2x ΔT +3'	ctrl	5' (<60°C)	---	PW	(ΔT) 69°C	---	ctrl	24'	116'
I3	Intensive short	-	-	-	-	-	-	-	(ΔT) 50°C	ΔT +2,5'	ctrl	(ΔT) 50°C	ΔT +10'	(ΔT) 68°C	---	ctrl	2x5' (<68°C)	2x ΔT +5'	ctrl	5' (<60°C)	---	PW	(ΔT) 69°C	---	ctrl	6'	85'
N2	Normal (max speed)	-	-	-	-	-	-	-	---	ΔT +6'	ctrl	(ΔT) 50°C	ΔT +4'	(ΔT) 68°C	ΔT +8'	ctrl	---	ΔT +4'	ctrl	5' (<60°C)	---	PW	(ΔT) 69°C	---	ctrl	24'	96'
N3	Delicate	-	-	-	-	-	-	-	---	ΔT +6'	PW	(ΔT) 50°C	ΔT +2'	(ΔT) 55°C	ΔT +12'	PW	---	ΔT +4'	PW	5' (<60°C)	---	PW	(ΔT) 69°C	ΔT +1'	PW	24'	95'
N4	Delicate without prewash	-	-	-	-	-		-	---	---	---	(ΔT) 50°C	ΔT +2'	(ΔT) 55°C	ΔT +12'	PW	---	ΔT +4'	PW	5' (<60°C)	---	PW	(ΔT) 69°C	ΔT +1'	PW	24'	86'
N5	Normal 3 rinses	-	-	-	-	-	-	-	---	ΔT +6'	ctrl	(ΔT) 50°C	ΔT +4'	(ΔT) 68°C	ΔT +8'	ctrl	2x3' (<65°C)	2x ΔT +3'	ctrl	5' (<60°C)	---	PW	(ΔT) 69°C	---	ctrl	24'	99'
N6	Normal 3 rinses without prewash	-	-	-	-	-	-	-	---	---	---	(ΔT) 50°C	ΔT +4'	(ΔT) 68°C	ΔT +8'	ctrl	2x3' (<65°C)	2x ΔT +3'	ctrl	5' (<60°C)	---	PW	(ΔT) 69°C	---	ctrl	24'	90'
E1	Energy label Axx	-	-	-	-	-	-	-	---	ΔT +10'	PW4	11'(<62°)	ΔT +47'	---	---	PW4	5'(<60°C)	---	PW	---	ΔT +4'	PW4	10' (<69°C)	---	PW 4	76'	171'
E5	Energy label Auto Performance	-	-	-	-	-	-	-	---	ΔT +8'	PW	11'-12,5' (<65°C)	ΔT +41'	---	---	PW	5'(<60°C)	---	PW	---	ΔT +2'	3x5s Con 2800	10'-11,5' (<69°C)	ΔT +2'	PW	64'	150'
Auto	Auto 50-65°C	-	-	-	-	-	-	-	---	ΔT +8'	ctrl	(ΔT) 50°C	ΔT +4'	(ΔT)68° C	ΔT +8'	ctrl	---	ΔT +4'	PW	5' (<60°C)	---	PW	(ΔT) 69°C	ΔT +1'	PW	24'	85'-110'
Q1	Short	-	-	-	-	-	-	-	---	---	---	(ΔT) 50°C	---	---	---	PW	---	ΔT +4'	PW	5' (<60°C)	---	PW	(ΔT) 69°C	ΔT +2'	PW	'	48'
Q4	Soak	-	-	-	-	-	-	-	---	ΔT +8'	PW	---	---	---	---	---	---	---	---	---	---	---	---	---	---	'	12'
Q5	Short 30 min.	-	-	-	-	-	-	-	---	---	---	14'(<65° C)	---	---	---	ctrl	---	---	---	5' (<60°C)	---	PW	9' (<69°C)	---	ctrl	'	31'
Q6	Heat plates	-	-	-	-	-	-	-	---	---	---	---	---	---	---	---	---	---	---	---	---	---	(ΔT) 69°C	ΔT +2'	PW	'	29'
Q7	Glassware	-	-	-	-	-	-	-	---	---	---	(ΔT) 45°C	ΔT +9'	---	---	PW	5'(<60°C)	---	PW	3' (<55°C)	ΔT +3'	PW	(ΔT) 55°C	---	PW	24'	69'

Note: *The total times for the programmes are approximate, only, and do not include regeneration/resin washing steps since these steps are handled on an "as needed" basis and not necessarily performed in every programme.*